

Sanitary Survey Field Guide



Information for Washington's Third-Party Sanitary Surveyors



DOH 331-486
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A sanitary survey is an inspection of water system facilities, operations and records used to identify conditions that may present a public health risk. Sanitary surveys give small system owners and operators an opportunity to identify weaknesses in technical, financial or managerial capacity. Sanitary surveys play a fundamental role in ensuring that public water systems provide safe and reliable drinking water to the people of Washington State.

Washington State drinking water rules require all Group A public drinking water systems to participate in a routine sanitary survey once every three to five years. The Washington State Department of Health Office of Drinking Water (DOH) conducts sanitary surveys. We also contract with some local health jurisdictions (LHJs) and private-contract surveyors to conduct surveys. We refer to LHJ staff and private contract surveyors we've approved to conduct surveys as "third-party surveyors." This document may also refer to them as "the surveyor."

1.0 Purpose

In 2013, we initiated a comprehensive review of our sanitary survey program, including a revision of the sanitary survey checklist. During this process, we decided a field guide would be a useful tool for our third-party surveyors. We also expect the field guide to be a useful reference for DOH staff as they support third-party surveyors, conduct their own sanitary surveys and communicate with water systems about their surveys.

We designed this field guide around the *Third-Party Sanitary Survey Checklist*¹. It provides information and guidance on our expectations for our sanitary survey program participants.

We hold third-party surveyors accountable for completing and documenting a sanitary survey properly. They operate as our contractor and do work on our behalf. As such, we are partially responsible for the quality of their work. We are committed to providing our surveyor partners the training, field guidance and administrative support they need to be successful in fulfilling their tasks.

We expect third-party surveyors to follow the direction in this field guide as they conduct inspections and complete sanitary survey checklists.

This field guide explains:

- Sanitary survey program administration.
- How to prepare for a sanitary survey.
- How to conduct a safe and effective sanitary survey.
- The significance of each sanitary survey checklist item.
- How to communicate sanitary survey findings to the water system and us.
- Follow-up with the water system on the sanitary survey findings.

¹ <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-487-F-report.doc>

1.1 Department of Health Contacts

Third-party surveyors with questions or concerns should contact us. See Table 1.

You can find contact information for LHJ programs in local information sources or online at <http://www.doh.wa.gov/AboutUs/PublicHealthSystem/LocalHealthJurisdictions.aspx>

Table 1
Office of Drinking Water Regional Offices

Eastern Region	Serving
Drinking Water Eastern Regional Office 16201 E. Indiana Ave., Suite 1500 Spokane Valley, WA 99216 Phone: 509-329-2100 Fax: 509-329-2104 TDD Relay: 1-800-833-6388	Adams, Asotin, Benton, Chelan, Columbia, Douglas, Franklin, Ferry, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman and Yakima counties.
Northwest Region	Serving
Drinking Water Northwest Regional Office 20425 – 72nd Avenue South, Suite 310 Kent, WA 98032 Phone: 253-395-6750 Fax: 253-395-6760 TDD Relay: 1-800-833-6388	Island, King, Pierce, San Juan, Skagit, Snohomish and Whatcom counties.
Southwest Region	Serving
Drinking Water Southwest Regional Office Physical: 243 Israel Road Tumwater, WA 98501 Mailing: P O Box 47823 Olympia, WA 98504-7823 Phone: 360-236-3030 Fax: 360-664-8058 TDD Relay: 1-800-833-6388	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Kitsap, Lewis, Mason, Pacific, Skamania, Thurston and Wahkiakum counties.

CHAPTER 2 Sanitary Survey Program Administration

Chapter 2 covers survey frequency and survey assignment criteria.

2.0 Survey Frequency

The frequency of required sanitary surveys for **Group A** public water systems is as follows (WAC 246-290-416):

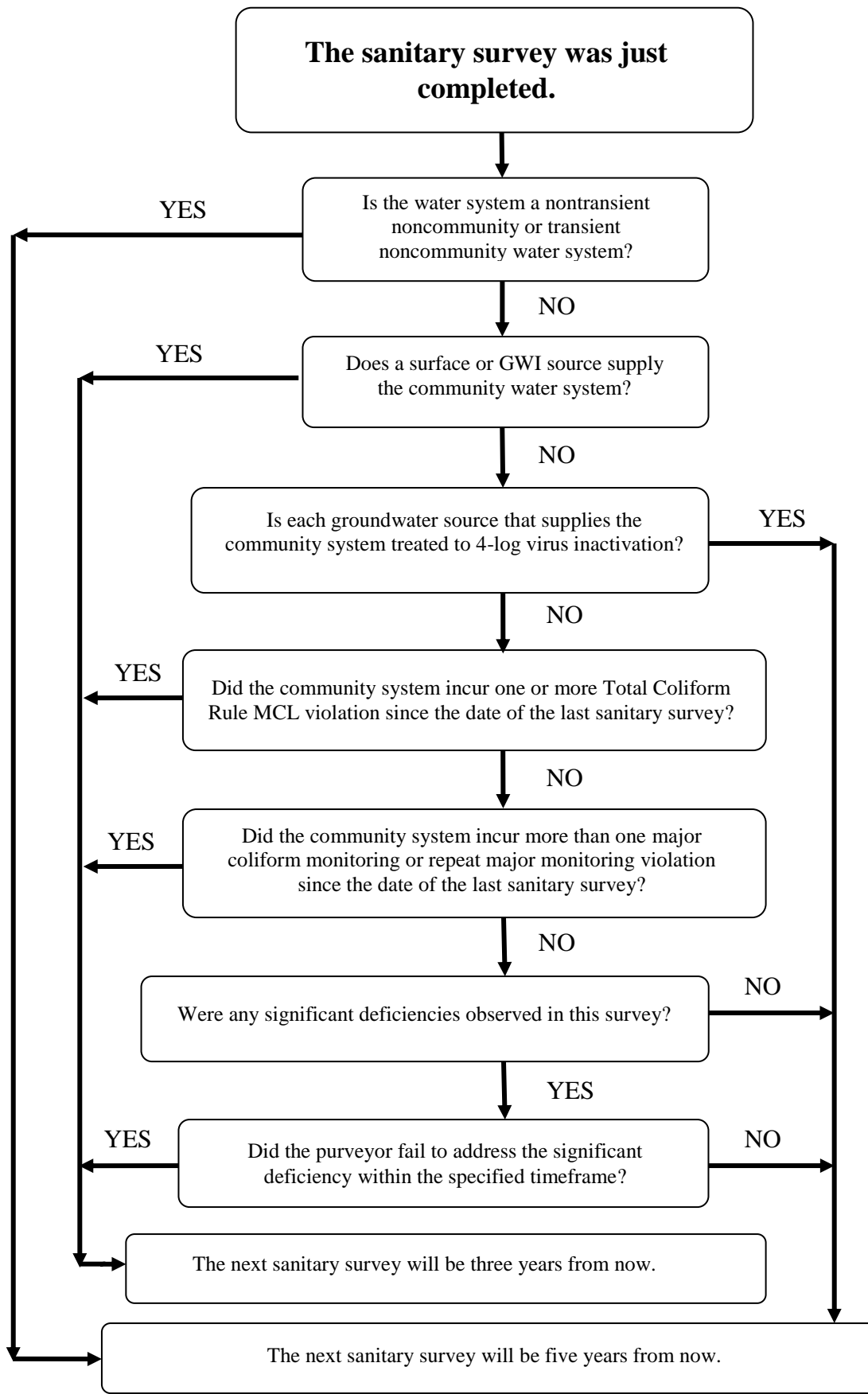
- A. **All noncommunity water systems**—at least once every five years.
- B. **Community water systems supplied by surface water or groundwater under the direct influence of surface water**—at least once every three years. In some system-specific circumstances, we may allow a reduced survey frequency of once every five years.
- C. **All other Group A community water systems**—at least every three years. If a system meets one of the following criteria, it may be surveyed once every five years:
 - i. Provides at least 4-log virus treatment before or at the first customer for all its groundwater sources (using inactivation, removal, or our approved combination of 4-log inactivation and removal).
 - ii. Since the last sanitary survey has not violated the total coliform maximum contaminant level (MCL) or had more than one total coliform monitoring violation, and has no unresolved significant deficiencies from the current sanitary survey.

The flow chart on Page 4 shows how and when we apply these criteria.

2.1 Survey Assignment Criteria

Near the end of each year, we determine which public water systems must be surveyed in the coming year. We usually assign surveys of noncommunity and small community systems to third-party surveyors. However, based on system-specific circumstances, we may choose to survey some of them (such as use of complex treatment, the period since we last visited the water system, water system compliance status, regional priorities and the availability of a qualified and experienced third-party surveyor).

We negotiate assignments with third-party surveyors as part of the consolidated contract or vendor agreement scope of work.



CHAPTER 3 Preparing to Conduct a Sanitary Survey

Chapter 3 explains what a surveyor needs to do to prepare properly for each sanitary survey.

3.0 Preparation Leads to a Successful Survey

The surveyor leads the survey. Therefore, you should research and plan each functional area of the survey in advance. Planning will enable you to shape events confidently, while building trust and respect, and create a more meaningful experience that goes beyond completing a checklist. (See Section 3.3)

Proper and thorough preparation for the sanitary survey will create the maximum amount of value to the water system, and increase your level of professional satisfaction. Regardless of how experienced you are as a surveyor, you should never “wing it.”

You also should be alert to our survey program initiatives or focus areas. The survey program is an important avenue for direct in-person interaction with every public water system in the state. We may ask surveyors to assist in one-time or ongoing initiatives aimed at disseminating or collecting information during surveys of all or some types of water systems.

3.1 Notifying the Water System of the Sanitary Survey Requirement

At the start of each year, we send notification letters to each water system scheduled for a survey that year. The letter indicates the third-party surveyor will be in touch with the purveyor to schedule a survey date within the calendar year. See the sample notification letters in Appendix A.

The initial notification letter includes a link to the sanitary survey checklist. It also advises operators or owners that we expect them to conduct a pre-survey assessment of their water system and correct significant deficiencies and significant findings *before* the sanitary survey.

3.1.1 Preparing the water system

As part of your initial contact with the water system, you should notify the operator or owner to prepare for the survey. You can mail a letter, send an email or call them to let them know it's important for the water system to:

- A. Find the system's current water system plan or small water system management program and make it available during the survey.
- B. Assemble the cross-connection control ordinance, name of cross-connection control specialist, and cross-connection control assembly installation and testing records.
- C. For systems with reservoirs that must be climbed to inspect the roof: Take photographs to depict the condition of the reservoir roof, roof hatch, roof vent, and reservoir overflow and make copies available during the survey.

- D. Find the water quality monitoring report for the current year and make it available during the survey.
- E. Make the well logs available during the survey.
- F. Assemble all correspondence related to the previous sanitary survey, including cover letter, checklist, and follow-on correspondence about significant deficiencies, significant findings or other required actions (See Section 5.1).
- G. **Community Systems Only:**
 - i. If they serve 1,000 or fewer connections, ask them whether they completed the [online capacity assessment](http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemAssistance/CapacityDevelopment/CapacityAssessment.aspx)². If not, encourage them to do so.
 - ii. Summarize power outages and water outages over the last two years.
 - iii. Provide a copy of the current budget, revenue forecast and water rate structure. (This is why it's important to have a governing board member or system owner present during the survey.)
 - iv. Provide a copy of the current capital improvement plan
- H. Remind the operator or owner to conduct a self-survey of the water system before the scheduled survey.

3.2 Scheduling Sanitary Surveys

3.2.1 When and Who to Contact

After they receive our initial notification letter, a water system may contact you before you contact them to schedule the survey. If not, you should write, email, or call the system's main contact (listed on the Water Facilities Inventory) at least a month before the desired survey date. We expect the certified operator, if there is one, to be present during the sanitary survey. We also would like you to invite the system owner or representative of the governing board to the survey. Even if the owner declines the invitation, it provides an opportunity to explain the survey's purpose and scope, rather than leaving that task to the operator.

If there is no certified operator (most TNC water systems), ask the owner if there is a satellite management agency (SMA) assigned to help manage and operate the system. If so, let the owner know that you intend to invite a representative from the SMA to the survey.

3.2.2 Survey Time in the Field

You should schedule at least three hours of field time for community water system surveys, and at least 90 minutes of field time for noncommunity water system surveys. When conducting

²

<http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemAssistance/CapacityDevelopment/CapacityAssessment.aspx>

multiple surveys of systems managed and owned by different individuals you should build some flexibility into your schedule between surveys. If you must cancel or you know you will be late for a survey appointment, call the water system and explain your circumstance as soon as possible.

3.2.3 What if the Water System Refuses to Schedule a Survey?

You should record the background and reason(s) for refusal, and then contact our regional office. We will try to convince the system's main contact to cooperate in scheduling a survey. A water system's failure to cooperate in scheduling a sanitary survey is a rule violation subject to enforcement.

We will not reassign a survey to placate a system's concern over the designated third-party surveyor's fee except under exceptional circumstances.

3.3 Preparing for a Sanitary Survey

We expect third-party surveyors to review the following information before conducting a sanitary survey:

- Previous sanitary survey report
- Sanitary Survey Pre-Survey Data Packet
- Documents from our Regional Office (request via email)

3.3.1 Previous sanitary survey cover letter and checklist

Each sanitary survey is an event in a progressive process of improvement. This year's survey builds on the previous survey. When you review the previous sanitary survey cover letter and checklist, you will get important history about deficiencies and recommended practices, and be able to establish the direction and rate of change occurring in the water system's management and operation. The current survey will not be effective unless you know the findings and recommendations of the previous survey.

It is important that you perform a thorough survey. Do not rely on the data collected during previous surveys. Things can change significantly between surveys.

3.3.2 Sanitary Survey Pre-Survey Data Packet

You can get the *pre-survey data packet* from our [data system](#)³ (Sentry) or by contacting our regional office. The data packet includes detailed information on:

- Water quality
- Compliance
- Source
- Treatment plant
- Operating permit Status
- Operator certification

³ <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/SanitarySurveys.aspx>

3.3.2.1 Water quality sampling history

The pre-survey data packet is rich with water quality information. When reviewing water quality test results, you should look for year-over-year trends or patterns (nitrate, coliform), and how these changes coincide with other events (rainfall, construction, source usage, aquifer level).

3.3.2.2 Compliance history

You should review the compliance section of the pre-survey data packet. Noncompliance that leads to a *Notice of Violation* is significant, so plan to spend time discussing the circumstances surrounding past noncompliance, especially in the following program areas:

Water quality monitoring: Noncompliance with monitoring is a sign of failure. It could be because the operator failed to take the required samples, despite our notices and offers of technical assistance. It also could indicate a failed relationship between the operator (who knows of the need to take the samples) and the owner (who refuses to pay for the sampling). You should inquire about the reasons for noncompliance, and note the water system's response in the survey cover letter or checklist.

Sanitary survey: Noncompliance with sanitary surveys could mean the operator or owner rejects the importance of the survey findings, and has obvious implications for the survey you are about to perform. You should inquire about the reasons for noncompliance with the previous survey, and note the water system's response in the survey cover letter or checklist.

Install treatment: Noncompliance in this area may reflect poor financial condition, or a lack of concern about delivering reliable safe drinking water. These problems may be more the result of poor water system management, poor communication between the owner and operator or owner and consumers, or a general lack of understanding. You should inquire about the reasons for noncompliance, and note the water system's response in the survey cover letter or checklist.

3.3.2.3 Source and Treatment Plant

The source and treatment information in the pre-survey data packet is a partial extract of source information from the *Water Facilities Inventory* and treatment plant information from Sentry.

3.3.2.4 Operating permit status

Operating permits serve as an enforcement tool and show the compliance status and adequacy of a public water system. Information about our [operating permit program](http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/Enforcement/OperatingPermits.aspx)⁴ and the meaning of a water system's operating permit status is online.

3.3.2.5 Operator Certification

The operator certification information in the pre-survey data packet will identify the certified operator of record (if the system requires a certified operator). If that individual is not present at the survey, despite your efforts to invite the operator when scheduling the survey, inquire and make note of the reasons given for his or her absence in the survey cover letter or checklist.

⁴

<http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/Enforcement/OperatingPermits.aspx>

3.3.3 Documents from our Regional Office

Upon request, the regional office may provide system-specific information that you can review with the water system during the survey, such as:

- Capacity assessment (completion status)
- Complaint records
- Chlorination reports
- Water facilities inventory
- Water Quality Monitoring Report
- Current and historical projects list
- Consumer confidence report

3.3.3.1 Capacity assessment (applies only to community systems with 1,000 or fewer service connections)

Upon request, we will inform you whether the water system completed the online assessment. If so, discuss the assessment with the water system. If not, discuss the reasons the water system hasn't taken the assessment. Questions may arise about the assessment tool, so you should be familiar with its scope and purpose by reviewing the information on our [capacity assessment webpage](http://www.doh.wa.gov/CapacityAssessment.aspx)⁵.

3.3.3.2 Complaints

We may give you a report from our complaints database. If so, review with the water system the background of each complaint, and record any significant change in operating procedures or improvement to facilities implemented in response to a complaint in Part N.

3.3.3.3 Chlorination Reports

Recent chlorination reports contain valuable information about the reported level and reliability of treatment. We require each water system to maintain its own set of chlorination reports, so even if you do not receive a copy from us, you should ask the water system to review the last 12 months of chlorination reports. Go over them with the water system and discuss any periods of missed monitoring and inadequate residual levels.

3.3.3.4 Water facilities inventory (WFI)

An essential element of any sanitary survey is to review and confirm or correct the accuracy of WFI information. See Appendix F for a copy of a blank WFI form, and the instructions we give water systems when completing or updating the form. You should understand the information we request in the WFI before discussing accuracy with the water system.

At a minimum, you should ask the water system to confirm the accuracy of these WFI entries:

- Actual production capacity of the well (or flow capacity through an intertie, if any).
- Missing treatment information, or treatment once used but discontinued.
- Whether the source is metered.
- Designation of the source use (permanent, seasonal, emergency).

⁵ <http://www.doh.wa.gov/CapacityAssessment.aspx>

- Designation of source status (active, inactive).
- Depth to the first open interval (first perforation in the casing; top of well screen).
- Number of connections (all types).

Clearly mark corrections directly on the WFI and explain the reason for the change. Submit to us a copy of the corrected WFI with your completed checklist.

Changes to the number and type of population served, the number or type of connections served, source use or treatment could affect the system classification, approval status or water quality monitoring requirements. Contact our regional office if you have any questions.

3.3.3.5 Water Quality Monitoring Report (WQMR)

We can give you an electronic copy of the current water quality monitoring report we prepared for the water system. We generate these reports for community and nontransient noncommunity water systems, to help them understand their future water quality monitoring requirements. This document will help you discuss future water quality sampling requirements with the water system.

3.4 Tools and Equipment

To meet our expectations for a thorough sanitary survey, you will need the following tools:

- Camera and spare batteries
- Sanitary survey checklist
- Flashlight
- Mirror to view under things
- Long, thin screw driver or other device capable of safely probing surfaces and crevices
- Cell phone
- Free chlorine residual field test kit
- 100-foot tape measure
- Earplugs, gloves, and eye protection (see Section 4.6 Safety)

CHAPTER 4 Conducting a Sanitary Survey

Chapter 4 explains how to make the most of the time you spend with a water system and reduce the risk of injury while conducting a sanitary survey.

4.0 Making the Most of Every Moment

Surveyors should prepare to engage in active listening during every part of the survey. If something isn't clear, you should continue inquiry until you understand.

You can gather a wealth of information from casual conversation when moving between office and field sites, or during breaks in the survey. You can ask about the operator's experience with this utility (and with other utilities), experiences dealing with emergencies or health advisories, motivation (what gives him or her pride at work?) and time, knowledge, resource, or management support limitations.

Throughout the survey, listen for a better understanding of the following; write them down and share them with us:

- The operator's relationship with the governing body.
- The operator's level of awareness that—in addition to running the daily operation of a water utility—his or her decisions and actions influence the citizens' health and livelihood, and the value of their homes and businesses
- What the operator needs or wants from health officials that will enable him or her to do a better job

Bring business cards. After the survey, water systems want to know exactly who the surveyor was and how to contact him or her directly.

4.1 Survey Objectives

Tell (or remind) the water system what you came to accomplish. This is a very important initial step in the survey process. The stated survey objectives should be to:

- Identify issues that threaten the safety and reliability of the drinking water supply.
- Understand the operation of the water system; its capabilities, weaknesses, and current condition.
- Understand the water system's challenges, and the owner or operator's commitment and level of preparedness to face those challenges effectively.
- Identify gaps between what should be and what is, and understand the role health officials can play in closing those gaps

Ask what the operator wants to see as an outcome from the survey, and include this input in the survey objectives.

4.2 Surveyor Behavior

Conduct every aspect of the survey in an efficient, effective and professional manner. Even if an owner or operator confronts you, try to remain even-tempered and non-confrontational. If you ever feel the need to see evidence of a statement the owner or operator makes, don't hesitate to ask politely for the information in a manner that doesn't challenge their honesty. Sometimes just a smile, then a statement like "I trust you, but my job here today is to verify information," will carry the moment.

4.3 Identifying Safety Hazards

The surveyor should ask about potential safety hazards at the start of the survey (See Section 4.6). Then, discuss ways to mitigate or avoid those dangers while accomplishing the goals of the survey.

4.4 Office Time

It is important to spend office time with the operator (and owner or governing board member, if present) before and after the field inspection. Try to avoid conducting these pre- and post-field work meetings in a vehicle or outdoors. It is important to convey that the conversation you are having is important and worthy of their full attention. If they don't have an "office" or other private space to meet in, suggest meeting in a suitable public building, such as a café or convenience store with public seating, or a town hall or public library meeting room.

The subjects to complete during a sit-down meeting BEFORE the field inspection include:

- WFI data review (See Section 3.3.3)
- Confirm availability of documents you asked them to assemble before the survey (See Section 3.1.1)
- Review any deficiencies identified in the last survey; discuss resolution and current status
- Checklist Part B: General water system description
- Checklist Part C: Operations and management
- Checklist Part J: Distribution system
- Checklist Part K: Cross-connection control program review
- Compliance review (See Section 3.3.2)
- Regional office specific information (See Section 3.3.3)

The subjects to complete back in the office AFTER completing the field inspection include:

- Checklist Part L: Operator
- Checklist Part M: Other
- Checklist Part N: Field Notes and Safety Concerns

Also, while meeting after the field inspection, review any significant deficiencies or significant findings you observed during this survey and discuss the next steps.

Let them know that we will review and confirm your written survey findings. We will assign a due date for the water system to correct any significant deficiencies or significant findings. If the owner or operator can correct a deficiency or finding before you submit your report to us, include a description of the completed work in your cover letter.

4.5 Field Time

You should complete the following parts of the survey checklist with the operator during the field portion of the survey (and owner or governing board member, if present):

- Part D: Sources
- Part E: Chlorination
- Part F: Other treatment
- Part G: Well pumps, booster pumps, and controls
- Part H: Pressure tanks
- Part I: Water storage tanks

4.6 Safety

This section covers alternative ways to obtain important survey information in the field, while ensuring personal safety and protection. Your employer or insurance company may have their own guidance or requirements. If so, they supersede the following information.

Field settings vary tremendously, and some physical settings are not safe to inspect fully. If the setting is not safe, or you believe it is not safe, do not go there. Safety is a serious consideration and must be a top priority for all surveyors. We will never criticize a surveyor who observes unsafe conditions that prevent him or her from completing a sanitary survey. Record safety concerns in Part N of the checklist.

If workplace safety concerns make important water system facilities unavailable for inspection, you are empowered to determine that the water system failed to provide for the unrestricted availability of all facilities and records at the time of the survey (see WAC 246-290-416 (2)(c)). If that occurs, we will send the water system written notice that it is in violation of state rule because it cannot be surveyed (WAC 246-290-416).

The Department of Labor and Industries (L&I) regulates workplace safety in our state. If you find unsafe conditions in the field and you feel you have competent knowledge of basic safety standards, we encourage you to point out the safety hazard and refer the operator to L&I's consulting services. Personal safety is a fundamental job responsibility, and you must take it very seriously.

DO NOT enter a space if you have to wear a respirator to enter, or it appears to be a confined space. You should ask your employer about the definition of a confined space and their confined space protocols. If you encounter a confined space during an inspection, look for alternative ways to determine the condition of the facility. Alternate ways may include information from the water system, previous inspections, using a camera or flashlight to inspect

the interior, or referring to design drawings. If you aren't sure whether an area is a confined space, call your supervisor. Surveyors should err on the side of caution.

Other ways to collect data when you can't proceed safely:

- Ask the operator to bring photos or videos to the survey that show the tank penetrations are sealed; hatch sealed, in good condition and locked; vents screened properly; and overflow screened properly and with a proper air gap.
- If it's a confined space or you observe other unsafe workplace conditions, take photos of the area without entering the space.
- Ask a professionally trained or certified inspector to collect the information.
- Review tank cleaning photos and videos if water system performed the work within the last year.

You may find chemical safety hazards while conducting sanitary surveys and field visits. Use your best judgment before proceeding, and **DO NOT** enter if you can't do it safely. If necessary, you should explain to the operator why you can't proceed.

The following will help you evaluate whether you can work safely in the area.

- Ask the operator about the chemicals being used (gas chlorine, powdered chlorine).
- Don't risk exposure to improperly stored, unmarked, or unknown chemicals.
- Are there hazards that require personal protective equipment (PPE)? (for example, head, eye, face, hand or foot protection)
- If yes, do you have the right PPE for the situation? Were you trained how to use the equipment? Do you know its limitations?

We don't expect surveyors to be safety experts, but we do expect them to use common sense when preparing for and conducting a survey. For example,

- Wear appropriate clothing for the weather.
- Wear appropriate footgear. You may need to walk over rough terrain.
- Carry earplugs, gloves, and eye protection, so you have them if you need them.
- Practice safe ladder use.
- Maintain awareness of dogs, snakes and spiders.
- Avoid areas infested with mice feces and urine.
- Avoid contact with mechanical and electrical equipment.
- Stay clear of active construction sites.
- Avoid structures that appear unstable.
- If the operator or owner becomes threatening or aggressive, leave immediately.

4.7 Field Summation

Before departing, you should sum up the survey by reviewing the following with the operator:

- The objectives of the survey.

- The significant deficiencies and significant findings, if any, and the water system's obligation to address them promptly.
- The fee for the survey, and when the invoice will be sent. If an LHJ requires payment in advance of the survey, this would not apply.
- The completed checklist and cover letter documenting survey findings will be sent to the water system within 30 days.
- Resources available after the survey to answer questions and provide technical assistance related to survey findings, such as our *Small Water System Program Management Guide*⁶ (331-134).

⁶ <http://www.doh.wa.gov/portals/1/Documents/pubs/331-134.doc>

CHAPTER 5 Third-party Sanitary Survey Checklist

We designed the sanitary survey checklist for use when inspecting small groundwater systems without complicated treatment. We intend the checklist to complement a surveyor's own expertise developed through training and experience.

The checklist is not complete or exhaustive. We expect surveyors to use their knowledge of water system operation, and their knowledge of sanitary principles to conduct a complete and effective sanitary survey of a drinking water system.

Appendix E describes in detail the meaning and significance of each sanitary survey checklist item. We explain each question and prompt from our sanitary survey checklist along with its significance and connection with other drinking water issues. The information in Appendix E includes information a surveyor can share with a water system owner or operator.

5.0 Classifying Sanitary Survey Findings

The better you understand the reason and background of each checklist item, the greater the influence you will have on the water system. For the most part, operators and owners want to do what's right and take their cues from health officials.

Expressing the public health significance of the checklist items during the sanitary survey increases the likelihood that water system officials will internalize the message. In turn, they will demonstrate the kind of sustained, independent action we want to see from the people who deliver drinking water to our family, friends and neighbors.

Survey findings fall into one of five categories:

1. Significant deficiencies
2. Significant findings
3. Internal program referrals
4. Observations
5. Recommendations

Chapter 6 provides further guidance on writing survey findings in the survey cover letter.

5.1 Significant Deficiencies and Significant Findings

5.1.1 Definitions

Certain checklist items are “significant deficiencies,” and others are “significant findings.”

***“Significant Deficiency”** includes, but is not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the State determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers (40 CFR 141.403(a)(4)). If left unaddressed, a significant deficiency directly creates a significant public health risk.*

“Significant Finding” means:

- a. *A lack of access or information which interferes with the surveyor’s assessment into whether a Significant Deficiency actually exists; or*
- b. *A defect or problem, which, if left unaddressed, indirectly creates a significant risk to the physical safety, security or reliability of the public drinking water supply.*

5.1.2 Significant Deficiencies

A significant deficiency is something of great concern to us because it signifies an immediate or potential risk to the health of the water system customers. Water systems must correct significant deficiencies, or submit a credible plan aimed at correction, to us within 45 days after the date on the survey cover letter. We will track the status of each significant deficiency through to resolution. Designating a problem as a significant deficiency means we will apply active, progressive enforcement tools when necessary. This may include issuing a penalty for failure to comply.

As described in Chapter 3, when we notify the water system about the survey we also establish an important expectation: investigate, find and fix any significant deficiencies as soon as possible and **prior to the survey**. We may notify our Operator Certification Program of significant deficiencies you find that we consider the result of operator negligence. The Operator Certification Program may follow up with the operator in responsible charge and hold the operator accountable for the significant deficiency.

The items identified in highlighted and **bold font** on the checklist are “significant deficiencies.” This list is exclusive; meaning those and no other checklist items are a significant deficiency.

5.1.3 Significant Findings

A significant finding is a problem that imparts a serious but less direct public health threat than a significant deficiency. Water systems must correct significant findings, or submit a credible plan aimed at correction, to us within the timeframe specified in the survey cover letter. The default is 45 days after the date on the survey cover letter. We will track the status of each significant finding through to resolution. Designating a problem as a significant finding means we will apply active, progressive enforcement tools when necessary. This may include issuing a penalty for failure to comply.

The highlighted items (not bold font) identified on the checklist are “significant findings.” This list is not exclusive; meaning the surveyor may propose other checklist items or other field observations not on the checklist as significant findings, if the circumstances warrant.

You may see a problem in the field not designated as a significant finding on the checklist. If you believe the magnitude of the problem is such that we should track correction of the problem through to resolution, you can propose classifying the problem as a significant finding in the comments section of Part N on the checklist. After reviewing the circumstances you describe, our regional office will decide whether a problem not identified on the checklist should be classified as a significant finding.

For example, under Part D Sources, the checklist does not identify the following checklist items as significant findings:

- *Is the well house properly constructed and maintained?*
- *Is there evidence of rodent infestation?*

However, if the surveyor believes the egregiously poor condition of the pump house and significant rodent infestation is a barrier to the safe and reliable operation of the system, then the surveyor may propose in Part N of the checklist that these items be classified as significant findings.

5.2 Internal Program Referrals

Surveyors may wonder why the sanitary survey checklist does not list a certain item as a significant deficiency or significant finding.

As mentioned in Section 5.1.2, you can propose classifying a problem not on the checklist as a significant finding in the comments section of Part N on the checklist. After reviewing the circumstances you describe, our regional office may refer the problem to the appropriate internal program specialist for action.

An “internal program referral” is a sanitary survey finding we believe we can best address by tapping into to expertise of a specific program area (such as our Surface Water Program for potential GWI). See Page 19 for the list of internal program referrals. These items are in *italic type* on the third-party checklist.

If you identify an issue listed on Page 19 (in *italic type* on the third-party checklist), our regional office will use your finding as the basis for referring the issue directly over to our program specialist for action. Therefore, you should not direct the system to address these items as part of the post-sanitary survey correspondence. Instead, our program specialist will investigate the issue, likely consult with the water system, and issue a directive, if needed. If you believe any of these issues demand immediate attention, call our regional office during the survey itself for consultation.

The checklist might not identify a problem observed in the field as a referral. If you believe a DOH program specialist should investigate a problem to determine whether it’s significant, you should make a note of it in the comments section of Part N on the checklist. The DOH regional office will review the information and determine whether further DOH investigation is necessary.

Checklist number	Checklist Question
18	<i>Is the source a potential GWI?</i>
41	<i>Does the operator routinely <u>batch</u> chlorinate the source, the distribution system, or the reservoir just before collecting routine or repeat coliform samples?</i>
51a	<i>A surveyor's measurement of free chlorine at the CT compliance point indicates inadequate treatment</i>
52	<i>Are the chlorine pump and pump controls constructed and maintained to provide uninterrupted, reliable CT6 treatment?</i>
87	<i>Does the system provide adequate pressure throughout the distribution system?</i>
102	<i>Is the operator performing measurements and calibration of water treatment monitoring equipment consistent with manufacturer recommendations?</i>
103	<i>Is the operator using proper inputs to treatment plant operations reports, such as correct volume, peak flow rate, time, and making the proper calculations?</i>
104	<i>Does the operator sample water quality at the proper location?</i>
N/A	Someone other than the certified operator in responsible charge is carrying out the duties of the certified operator as outlined in regulation If yes, call our regional office immediately after the survey.
N/A	Is the water system operating a primary contaminant treatment facility without appropriately certified personnel? If yes, call our regional office immediately after the survey.
N/A	Do you have any reason to suspect false or misleading reporting of water quality, treatment operations, status of previously identified significant deficiencies, or completion status of mandatory public notification? If yes, call our regional office immediately after the survey.

5.3 Observations

Observations directly reference a regulatory requirement. Observations do not include items classified as significant deficiencies or significant findings. Third-party surveyors should identify any unmet regulatory requirement as an observation in the sanitary survey follow-up correspondence to the water system. We don't track observations for compliance or give the system a deadline to address or correct the defect or problem. Instead, the surveyor's observations put the water system on notice that currently it does not meet a regulatory requirement.

5.4 Recommendations

Third-party surveyors may offer any recommendation they deem appropriate. Recommendations do not include items classified as significant deficiencies, significant findings or observations.

5.5 What if the Purveyor Refuses the Surveyor Entry?

When the water system staff refuses to allow you to conduct the scheduled inspection, or establishes conditions that limit the scope of the survey, you should:

- Remain non-confrontational and professional.
- Inform them that you have authority to conduct the survey as our delegated representative (WAC 246-290-416).
- Obtain the reason for denial of access.
- Record the name and title of the individual denying access, and the date and time.
- Try to obtain a formal statement from the water system to document specific issue(s). You should ask the facility representative to write a statement describing the issue(s), or alternatively, write the statement and obtain the facility representative's signature.
- Conclude the survey.
- As soon as possible, after leaving the water system, call our regional office and report the details of the denial of access.

If a partial denial of access occurs, such as a refusal to allow photographs or enter certain buildings, you should continue with the survey and record the operator or owner's reason(s) for refusal. You should also inform them that such refusal might require a second survey **at an added expense to the water system**. We will follow-up with the purveyor.

CHAPTER 6 Communications

Chapter 6 covers the details of assigning surveys, interagency communications and expectations about communicating results of a third-party sanitary survey to the water system and us.

6.0 The Relationship between Third-Party Surveyors and DOH

We pay LHJs for sanitary surveys through the DOH-LHJ Consolidated Contract. We pay private contract surveyors for sanitary surveys through a vendor agreement between the contractor and us. Before we assign surveys to an LHJ or private contract surveyor, we ensure there are sufficient funds to pay for them.

Surveyors perform sanitary surveys on our behalf. The classification of deficiencies, timeframes given to address them, and the consequences of a water system's failure to address them are particularly important elements of the survey cover letter. The surveyor must state these items accurately. The following describes options for ensuring accurate sanitary survey information gets into the hands of the water system owner or operator in a timely manner.

6.0.1 LHJs

Surveyors will refer to the third-party checklist in identifying significant deficiencies and significant findings. DOH and the LHJ will decide how to send the final cover letter and checklist to the water system (see options below).

Within **30 days** after an LHJ sanitary surveyor completes a survey with an identified significant deficiency or significant finding, DOH or the LHJ will notify the system in writing (see options below). The written notice will assign a deadline to either:

- Correct the significant deficiency or significant finding.
- Address the significant deficiency or significant finding by submitting a plan and schedule to correct the defect or problem acceptable to us.

A tabulated summary of significant deficiencies and significant findings will be located near the beginning of the survey cover letter to the water system.

Significant deficiency: The deadline assigned to the water system for correcting or addressing a significant deficiency may not exceed **45 days** from the date on the written notice. The written notice will also state that failure to correct the significant deficiency by the specified deadline may result in formal enforcement.

Significant finding: The deadline assigned for correcting or addressing a significant finding is **usually 45 days**, but the surveyor may exercise his/her discretion in setting a deadline. The written notice will also state that failure to correct the significant finding by the specified deadline may result in formal enforcement.

Options for DOH-LHJ coordination on creating the final cover letter and checklist:

1. **Prepare one letter to the water system.** It should include a summary of the survey, findings, results and actionable items. This can happen three ways:
 - a. LHJ writes the survey cover letter. We review and approve the letter before the LHJ mails it to the water system.

- b. LHJ drafts the survey cover letter. We review it, copy it to our letterhead, sign it and send it to the water system.
 - c. LHJ supplies us with the raw survey information. We write the letter and mail it to the water system. (This option is available only with approval from the regional manager).
2. **Prepare (potentially) two letters to the water system.** This option is available only with approval from the regional manager. The process includes:
- a. The LHJ writes the initial survey cover letter and sends it to the system without our input.
 - b. We review a copy of the LHJ's cover letter; and, if the LHJ survey information indicates the system must correct a significant deficiency or significant finding, we send a second letter to the water system.

We consider an LHJ-led survey complete when the LHJ provides the cover letter as specified in the LHJ-DOH contract.

6.0.2 Private Contract Surveyors

Within **30 days** after a private-contract surveyor completes a survey with an identified significant deficiency or significant finding, DOH will notify the system in writing.

Private-contract surveyors may not send the survey cover letter and checklist to the water system. We will create a cover letter based on the photos and information in the *Third-Party Surveyor Checklist*⁷ and mail it to the water system.

We consider a private-contract surveyor-led survey complete when our regional office receives the completed electronic checklist, electronic photos and any other information (all sent electronically).

6.1 Cover Letters

As stated above, within **30 days** after an LHJ surveyor completes a survey with an identified significant deficiency or significant finding, DOH or the LHJ will notify the system in writing. If the survey takes multiple days, the 30-day deadline begins on the last day of the survey.

6.1.1 LHJs write-up their own surveys (Option 1a and 1b above)

To meet the 30-day deadline to mail the cover letter, LHJs must send an electronic copy of the draft cover letter, completed checklist and photos to our regional office **within 25 days** of the survey. This is necessary so that we can review the letter, return it to the LHJ or copy it onto our own letterhead, and send to the water system within 30 days.

Some LHJs require the water system to pay for the survey before releasing the final cover letter. Those LHJs must make sure the water system **prepays** for the survey so that there is no risk of delay in meeting our expectations on post-survey follow-up documentation.

⁷ <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-487-F.doc>

6.1.2 DOH writes the LHJ survey (Option 1c above)

To mail the cover letter within the 30-day deadline, the LHJ must submit the completed checklist, photos, and all other survey-related documentation electronically to our regional office **within 15 days** of the survey date. This is necessary so that we can compose the cover letter, format the photos and send the complete package of cover letter, photos, and checklist to the water system within 30 days.

6.1.3 DOH writes a second cover letter to the purveyor following an initial LHJ letter (Option 2 above)

DOH rarely uses this option because of potential confusion, complications and inefficiencies. The LHJ and DOH must agree on a deadline for us to receive the cover letter the LHJ sent to the water system so that we can review it and, when necessary, send our own letter to the water system within 30 days of the LHJ's survey.

6.1.4 Private Contract Surveyors

To meet the expectation that we use a private-contract surveyor's information to prepare the cover letter within 30 days, the surveyor must submit the completed checklist, photos, and all other survey-related documents electronically to our regional office **within 15 days** of the survey date. This is necessary so that we can compose the cover letter, format the photos and send the complete package of cover letter, photos, and checklist to the purveyor within 30 days.

6.2 Submitting Completed Checklist and Photos

Surveyors should mark every applicable box in the checklist appropriately.

We recommended that you take photographs in a manner that works from the general to the specific. For example, take a set-up shot showing the general area of the violation, then take a close-up of the violation itself. Take as many photographs as necessary to document your observations clearly.

To the extent possible, we want third-party surveyors to provide electronic photos of the following:

- **Each wellhead:** Show as much of the surrounding environment as possible. In the photo narrative, identify the well by source number, along with any other feature considered noteworthy.
- **Each treatment process:** Show as much of the treatment equipment and its relationship with other components as possible. In the photo narrative, identify the source to which the treatment is associated, along with any other feature considered noteworthy.
- **Each reservoir:** In the photo narrative, identify the reservoir by name, along with any other feature considered noteworthy.
- **Interior of each booster pump station:** In the photo narrative, identify the booster station by name, along with any other feature considered noteworthy.
- **Each significant deficiency:** (wherever possible). In the photo narrative, identify the significant deficiency by its associated checklist item number.

- **Each significant finding:** (whenever possible). In the photo narrative, identify the significant finding by its associated checklist item number.

6.3 Transmitting Third-party Surveyor Information to DOH

Each of regional office processes hundreds of surveys each year. Complete information formatted consistently across third party surveys is very important to efficiently reviewing and approving the valuable information surveyors collect from each survey.

We expect third-party surveyors submitting electronic versions of **draft** cover letters, checklists, photos and other documentation to us to:

- **Use the correct format for the transmittal email. See Appendix B.**
The subject line should be THIRD-PARTY SS INFO; <Name of the water system>; <Date of the field visit>. If the draft cover letter identifies a significant deficiency or significant finding, the subject line should be PRIORITY: THIRD-PARTY SS INFO; <Name of the water system>; <Date of the field visit>.
- **Use the correct format for the cover letter. See Appendices C and D.**
 - Introduction
 - Section on significant deficiencies (if any), followed by a standard statement about expectations for compliance
 - Section on significant findings (if any), followed by a standard statement about expectations for compliance
 - Section on observations (if any)
 - Section on recommendations, compliments, kudos, etc.
- **Use the following format and narrative for transmitting photos.**
 - Paste electronic photos into a Word document
 - Title each page of the photos with the name of the water system, date of the photos, and name of the surveyor.
 - Describe for each photo the scene with enough detail to understand the point of the photograph (e.g., identifying a problem, identifying facilities, relationships between features in the photo)
- **Complete the checklist.**
- **Include other documentation.**
Include surveyor's notes, photos the operator provided, updates to WFI, notes from office time discussions, and so on.)

Supporting documents included in the Appendix include:

- Appendix B: Example email transmitting draft or preliminary survey information to us for review.
- Appendix C: A copy of the LHJ cover letter template.
- Appendix D: An example of a completed LHJ cover letter.

6.4 Standard Language

Appendix E includes a standard response for every checklist item marked as a significant deficiency, significant finding or observation. Chapter 5 describes these three categories of sanitary survey findings. Each classification has its own place in the sanitary survey cover letter.

Appendix E also identifies appropriate areas for stating your recommendations. Be at liberty to express your professional judgment in the manner you consider most appropriate for any of the items classified as “recommendations” on the *Third-Party Survey Checklist*, or any other aspect not covered on the checklist.

The standard language provides clear direction to the water system on what is required. The standard language also helps us track whether the water system meets the requirement or expectation. All third-party surveyors should use the standard language wherever possible. Adjust the standard language, as needed, to fit to the context of each survey finding.

6.5 Compliments and Kudos

Writing survey letters and reports is not just about pointing out the incorrect, inadequate and unsafe. As a talented surveyor, you know the important role you play in reinforcing good behavior. We encourage you to freely express your positive impressions about the condition of facilities, the preparedness for the unexpected, and the obvious interest in improving operations and management, just to name a few. Cite specifics when offering a compliment on something done well.

We expect the operator, the owner or board of directors, and even some consumers to read the survey cover letter. Usually, these people are very interested in what you have to say about their water system. The way you present the information will have an effect on the way they receive it. Seek balance, cite specifics, stand firm on what matters, and always connect things to the basic fact that the water this water system delivers affects the health, and often the property values and economy, of those it serves.

7.0 We Want Results, Not Endless Compliance Actions

As stated above, the objective of each sanitary survey is to:

- Identify issues that threaten the safety and reliability of the drinking water supply.
- Understand the water system operation; its capabilities, weaknesses and current condition.
- Understand the water system's challenges and its commitment and level of preparedness to face those challenges effectively.
- Identify gaps between what should be and what is, and understand the role health officials can play in closing those gaps.

The ultimate goal of the sanitary survey program is to help water system personnel make improvements to their water systems, and increase awareness of the need to find and fix problems *before* they result in unreliable or unsafe drinking water. In doing so, we create conditions for a sustained, high level of public health protection.

If a water system doesn't address a significant deficiency or significant finding, or it fails to cooperate in scheduling and participating in a sanitary survey, we will take active enforcement to ensure compliance. Active enforcement usually means progressive escalation of enforcement measures, beginning with a Notice of Violation and ending with an Order and Imposition of Penalty.

7.1 In Summary

Your approach to the survey can help position water system staff to cooperate with any directives issued. You can also help them learn how to make improvements that will result in better survey outcomes next time. Here's how:

- Explain the water system's role in protecting public health.
- Remind them of their responsibility to routinely conduct self-surveys to find and fix potential deficiencies. Don't wait until the next survey! Significant deficiencies and significant findings are preventable if the operator or owner acts with due diligence to proactively find and fix problems with the water system.
- When you identify problems in the field, describe what you saw, why it's a problem, and your insights in how to resolve the problem.
- Describe why the problem is important with respect to the delivery of safe and reliable drinking water.
- Describe what they can expect from us if a problem is a significant deficiency or significant finding.
- Ask them if they have any questions, and allow time to answer each question fully.
- Give the operator or owner helpful DOH publications on pertinent topics. If necessary, send the publication or email a link to them when you return to your office.
- Give them your contact information and let them know you're available to answer any questions they may have later. Our LHJ-DOH and vendor agreement contracts reimburse certain technical assistance.

Appendices

- A. Initial DOH sanitary survey notification letter template.
- B. Format and content for transmitting survey information to us by email.
- C. LHJ sanitary survey cover letter template.
- D. Example LHJ sanitary survey draft cover letter.
- E. Sanitary survey checklist reference.
- F. WFI form and WFI instructions.

APPENDIX A

Initial DOH sanitary survey notification letter template

Example notification letter for third-party survey DOH issues the invoice

January 5, 2014

«Pwc_Contactname»
«Pwc_Address1»
«Pwc_Address2»
«Pwc_City», «Pwc_State» «Pwc_ZipCode»

Subject: «Pws_Systemname», ID #«Pws_PwsID», Benton County;
Sanitary Survey Inspection Due in 2014

Dear Water System Manager:

According to Department of Health (DOH) records, your water system is due for a sanitary survey in 2014. I am writing to notify you that the Benton-Franklin Health District will be in contact with you to schedule the survey. You may choose to contact the Benton-Franklin Health District directly by calling (509) 460-xxxx.

We expect the system operator who is most knowledgeable about the system's day-to-day operations to accompany the surveyor during the inspection. We also seek the active participation of the water system owner or a representative of the governing body during the survey. We value their input in areas of water system management, finances and planning. If the owner or governing body is not available to attend the survey, the surveyor may attempt to set up a phone interview before or after the survey.

Please plan to have your system's records available at the time of the inspection. It would be helpful to meet at an indoor location to review your files either before or after the survey.

Community Water Systems with 1,000 or fewer connections: The governing body and operator should work together to complete the online capacity assessment prior to your Sanitary Survey. We'll ask you whether you completed the assessment during your survey. To take the assessment now, go to <http://www.doh.wa.gov/capacityassessment.aspx> If you previously completed the assessment, now is a good time for the operator and governing board members to review and update their responses by going online and logging back into the assessment.

To ensure that your water system is free of deficiencies *before the surveyor arrives to conduct the survey*, please review your last sanitary survey report and correct any deficiencies listed. Contact me if you do not have a copy.

Conduct a pre-survey inspection of your water system and correct any deficiencies found.

- To help guide your self-inspection, review the [*Third-Party Sanitary Survey Checklist*](#)⁸

⁸ <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-487-F-report.doc>

- Be sure to pay special attention to the items noted in highlighted + bold and highlighted on the checklist. These represent significant deficiencies and significant findings, respectively. If the surveyor finds any of these during the sanitary survey, you will be required to address them in a short period of time. Listed below are the issues we expect you to attend to before the survey and fix as necessary:
 1. Complete a thorough inventory of the structures and material residing within 100 feet of your well(s) and 200 feet of your spring(s); identify all microbial and chemical contaminant threats; and prepare to review your plan to eliminate or mitigate the threat(s) with the surveyor during the survey. Refer to publication: *Sanitary Control Area Protection* (331-453).
 2. Look carefully at your well, spring, and storage tank facilities; make sure any possible pathway in which any contaminants could enter the well casing, spring box, or tank interior are sealed or screened. Refer to publications: *Sanitary Control Area Protection* (331-453), *Sanitary Protection of Reservoirs – Vents* (331-250), *Sanitary Protection of Reservoirs: Hatches* (331-249) and *Simple Fixes For Wellhead openings* (331-232).
 3. Physically disconnect any treatment process or source not listed on your water facilities inventory until you get direction from DOH that you may reconnect it.
 4. For any part of your water system that we may not be able to access—for example, reservoirs a surveyor must climb to inspect the roof or overflow—please take photographs to depict the condition of facility, and make copies available during of the survey. Take photographs to verify that all seals and screens on the storage tank roof vents, show access hatches open and closed, show that overflows and access points where the level gauge wire enters each tank are in excellent condition.
 5. Make sure your storage tank overflow pipe outlet is constructed with an air gap and screen.
 6. Make sure there is a raw-source-water sample tap on each source of supply, and a post-treatment sample tap (as applicable) after each treatment process.
 7. Make sure reasonable measures are in place to protect your well house, pump station and storage tank from unauthorized access and vandalism.
 8. Make sure the pump or well house structures are free of any openings that allow animals to enter.
 9. If your water system includes an RV sewage dump station, make sure there is an approved reduced pressure backflow assembly installed on the water supply to the dump station and confirm that it's been tested within the past year.
 10. If your water system injects any chemical, make sure the chemical is approved under NSF standards for use in potable water (NSF 60). Also, make sure that any hard-piped water supply into the chemical solution tank is either constructed with an air gap or equipped with an approved reduced pressure backflow assembly.
 11. If your water system has a turbine pump, make sure the outlet pipe for the pump control value or vacuum relief valve was constructed with an air gap and screen.

12. Make sure your pump and pump controls are operational and adequate to prevent chronic water outages or premature pump failure.

The Department of Health will charge a fee to help recover the cost of conducting the sanitary survey (WAC 246-290-990(3)(c)). The fees for water systems are as follows:

Noncommunity Systems 1-3 connections	\$400
Noncommunity Systems >3 connections	\$600
Community Systems.....	\$600

We understand the hardship and the cost that the survey can have on smaller systems. To help ease the financial burden, we can offer payment arrangements that spread the cost out over a number of months. To make payment arrangements, please contact me when you receive your invoice and cover letter.

When the survey is complete, you will receive a report identifying any deficiencies you need to address. You will generally receive a deadline of 45 days to either complete corrective actions associated with any deficiencies or, if a major project is involved, submit a corrective action plan.

Failure to cooperate in scheduling or participating in the sanitary survey, or failure to correct noted deficiencies will result in increased monthly coliform samples, and initiation of formal enforcement steps such as a red operating permit, state significant noncomplier (SNC) status, and the possibility of civil penalties.

Thank you for your ongoing commitment!

If you have any questions, please call me at 509-329-2136 or email danielle.russell@doh.wa.gov

Sincerely,

Danielle Russell

cc: «Own_Name», «Pws_Systemname»

Example notification letter for third-party survey
LHJ issues the invoice

January 5, 2014

«Pwc_Contactname»
«Pwc_Address1»
«Pwc_Address2»
«Pwc_City», «Pwc_State» «Pwc_ZipCode»

Subject: «Pws_Systemname», ID #«Pws_PwsID», Thurston County;
Sanitary Survey Inspection Due in 2014

Dear Water System Manager:

According to Department of Health (DOH) records, your water system is due for a sanitary survey in 2014. I am writing to notify you that the Thurston County Health Department will be in contact with you to schedule the survey. You may choose to contact the Thurston County Health Department directly by calling (360) 867-xxxx.

We expect the system operator who is most knowledgeable about the system's day-to-day operations to accompany the surveyor during the inspection. We also seek the active participation of the water system owner or a representative of the governing body during the survey. We value their input in areas of water system management, finances and planning. If the owner or governing body is not available to attend the survey, the surveyor may attempt to set up a phone interview before or after the survey.

Please plan to have your system's records available at the time of the inspection. It would be helpful to meet at an indoor location to review your files either before or after the survey.

Community Water Systems with 1,000 or fewer connections: The governing body and operator should work together to complete the online capacity assessment prior to your Sanitary Survey. We'll ask you whether you completed the assessment during your survey. To take the assessment now, go to <http://www.doh.wa.gov/capacityassessment.aspx> If you previously completed the assessment, now is a good time for the operator and governing board members to review and update their responses by going online and logging back into the assessment.

To ensure that your water system is free of deficiencies *before the surveyor arrives to conduct the survey*, please review your last sanitary survey report and correct any deficiencies listed. Contact me if you do not have a copy.

Conduct a pre-survey inspection of your water system and correct any deficiencies found.

- To help guide your self-inspection, review the [*Third-Party Sanitary Survey Checklist*](#)⁹
- Be sure to pay special attention to the items noted in highlighted + bold and highlighted on the checklist. These represent significant deficiencies and significant findings, respectively. If the surveyor finds any of these during the sanitary survey, you will be required to address them in a short period of time. Listed below are the issues we expect you to attend to before the survey and fix as necessary:

⁹ <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-487-F-report.doc>

1. Complete a thorough inventory of the structures and material residing within 100 feet of your well(s) and 200 feet of your spring(s); identify all microbial and chemical contaminant threats; and prepare to review your plan to eliminate or mitigate the threat(s) with the surveyor during the survey. Refer to publication: *Sanitary Control Area Protection* (331-453).
2. Look carefully at your well, spring, and storage tank facilities; make sure any possible pathway in which any contaminants could enter the well casing, spring box, or tank interior are sealed or screened. Refer to publications: *Sanitary Control Area Protection* (331-453), *Sanitary Protection of Reservoirs –Vents* (331-250), *Sanitary Protection of Reservoirs: Hatches* (331-249) and *Simple Fixes For Wellhead openings* (331-232).
3. Physically disconnect any treatment process or source not listed on your water facilities inventory until you get direction from DOH that you may reconnect it.
4. For any part of your water system that we may not be able to access—for example, reservoirs a surveyor must climb to inspect the roof or overflow—please take photographs to depict the condition of facility, and make copies available during of the survey. Take photographs to verify that all seals and screens on the storage tank roof vents, show access hatches open and closed, show that overflows and access points where the level gauge wire enters each tank are in excellent condition.
5. Make sure your storage tank overflow pipe outlet is constructed with an air gap and screen.
6. Make sure there is a raw-source-water sample tap on each source of supply, and a post-treatment sample tap (as applicable) after each treatment process.
7. Make sure reasonable measures are in place to protect your well house, pump station and storage tank from unauthorized access and vandalism.
8. Make sure the pump or well house structures are free of any openings that allow animals to enter.
9. If your water system includes an RV sewage dump station, make sure there is an approved reduced pressure backflow assembly installed on the water supply to the dump station and confirm that it's been tested within the past year.
10. If your water system injects any chemical, make sure the chemical is approved under NSF standards for use in potable water (NSF 60). Also, make sure that any hard-piped water supply into the chemical solution tank is either constructed with an air gap or equipped with an approved reduced pressure backflow assembly.
11. If your water system has a turbine pump, make sure the outlet pipe for the pump control valve or vacuum relief valve was constructed with an air gap and screen.
12. Make sure your pump and pump controls are operational and adequate to prevent chronic water outages or premature pump failure.

When the survey is complete, you will receive an invoice from Thurston County Health Department and a report identifying any deficiencies you need to address. You will generally receive a deadline of 45 days to either complete corrective actions associated with any deficiencies or, if a major project is involved, submit a corrective action plan.

Failure to cooperate in scheduling or participating in the sanitary survey, or failure to correct noted deficiencies will result in increased monthly coliform samples, and initiation of formal enforcement steps such as a red operating permit, state significant non-complier (SNC) status, and the possibility of civil penalties.

Thank you for your ongoing commitment!

If you have any questions, please call me at 360-236-3028 or email denise.miles@doh.wa.gov.

Sincerely,

Denise Miles

cc: «Own_Name», «Pws_Systemname»

APPENDIX B

Format and content for emailing draft survey information to us

To complete the timely processing of sanitary survey information sent by surveyors, it's important that the email transmittal go to the right people and in the proper format.

Transmittal Email Addresses

Regional Office	Send directly email to:	Send cc to: ¹⁰
Northwest	brian.boyce@doh.wa.gov	DOH regional engineer
Southwest	swro.sanitarysurvey@doh.wa.gov	DOH regional engineer
Eastern	danielle.russell@doh.wa.gov	DOH regional engineer

As applicable to the agreement each surveyor has with the regional office for communicating sanitary survey findings to us (See Chapter 6), transmit the following information:

- Completed checklist as a Word or PDF document. You must maintain the form of the checklist (columns, page sequence and so forth).
- Electronic photos pasted into a Word document. You should provide descriptions for each photo.
- Draft cover letter as a Word document. Follow the format presented in Appendix C.
- Scanned updated and signed WFI if changes must be made to WFI information

The subject line should be:

THIRD-PARTY SS INFO; <Name of the water system>; <Date of the field visit>

If the draft cover letter identifies a significant deficiency or significant finding, then the subject line in your email should be:

PRIORITY: THIRD-PARTY SS INFO; <Name of the water system>; <Date of the field visit>

¹⁰ If you need the email address for the regional engineer assigned to your county, contact our regional office.

APPENDIX C
Template for LHJ sanitary survey cover letter

Date

PWS Lead [attending the survey]

Subject: PWS Name, PWS ID, County; Third-party Sanitary Survey Inspection Report
Survey Date

Dear PWS Lead:

First paragraph:

1. Offer your thanks and name any other PWS representatives in attendance during the survey.
2. Include this or similar statement if the survey uncovered a significant deficiency or significant finding: “This report documents the information collected during this survey. I listed defects in your water system facilities or operations that need your immediate attention below as *significant deficiencies* or *significant findings*. The Office of Drinking Water reviewed this information and agrees with my conclusions and recommendations.”
3. Include this or similar statement if the survey did not uncover a significant deficiency or significant finding: “This report documents the information collected during this survey. The Office of Drinking Water reviewed this information and agreed with my conclusions and recommendations.”

Next two paragraphs if the survey uncovered a significant deficiency or significant finding:

You must complete the corrective action associated with each *significant deficiency* and *significant finding* listed below by [insert date 45 days from date on this cover letter]. After completing these corrections, please email verification of completion, including photographs and supporting narrative to [insert email address of Regional Office Sanitary Survey Program Coordinator] or mail it to [Regional Office address, attention Name of Regional Office Sanitary Survey Program Coordinator]. Reference your water system’s name, PWS ID #, and date when you corrected the items.

Ensuring your utility completes each corrective action is a high priority for the Office of Drinking Water. Failure to complete each of these corrections within the designated time may result in enforcement action. If you believe you need additional time to correct any defect, call the Office of Drinking Water at [phone number designated by the regional office]. You will be asked to justify your request for additional time.

Next paragraph if the survey uncovered a significant deficiency or significant finding:

List the significant deficiencies and significant findings in separate tables. Use standard language from the field guide whenever possible.

Next paragraph(s):

List and describe observations, recommendations, description of operations, data and WFI updates, tributes, compliments and so forth

Next paragraph:

By completing this sanitary survey, your water system met the requirements in WAC 246-290-416. The Office of Drinking Water will notify you of your next sanitary survey in three to five years. Please note that you should not interpret satisfying the requirements of a sanitary survey as meeting other applicable local, state or federal statutes, ordinances or regulations.

Next paragraph if the LHJ doesn't invoice itself:

A sanitary survey is a fee-for-service activity (WAC 246-290-990). DOH will send you an invoice for [insert based on DOH sanitary survey fee schedule: \$600 for all community systems and for noncommunity systems serving 4 or more connections, \$400 for noncommunity systems serving 3 or fewer connections].

Last paragraph:

Thank you for your cooperation in the successful completion of the sanitary survey. If you have any questions or need additional information please call me at the number below.

Salutation,

Surveyor's name

Surveyor's title

Surveyors phone number

Encl.: Copy of the completed sanitary survey checklist

Any other guidance document, fact sheet, or other information mentioned in the report

CC: [Regional office sanitary survey program coordinator]

APPENDIX D
Example LHJ sanitary survey cover letter

July 7, 2014

Mark Twain
222 River Road
Showboat, WA 99999

Subject: Showboat Association, PWS ID 01234, Cascadia County;
Third-party Sanitary Survey Inspection Report
Survey date - June 24, 2014

Dear Mr. Twain:

Thank you and Tom Sawyer for your time and attention during our recent sanitary survey. This report documents the information collected during the survey. I listed defects in your water system facilities or operations that need your immediate attention below as *significant deficiencies* or *significant findings*. The Office of Drinking Water reviewed this information and agreed with my conclusions and recommendations.

You must complete the corrective action associated with each *significant deficiency* and *significant finding* listed below by August 22, 2014. After completing these actions, please email verification of completion, including photographs and supporting narrative to Huck Finn at huck.finn@doh.wa.gov or mail it to:

DOH: Attention Mr. Huck Finn
1000 Picket Fence Drive
Delta, WA 99998

In your transmittal, please reference your water system's name, PWS ID #, and date when you corrected the items.

Ensuring your water system completes each corrective action is a high priority for the Office of Drinking Water. Failure to complete each of these corrections within the designated time may result in enforcement action. If you believe you need additional time to correct any defect, contact the Office of Drinking Water at 555-555-5555. You will be asked to justify your request for additional time.

Significant Deficiencies

Checklist # Corrective Action Needed within 45 days

- | | |
|----|--|
| 23 | Seal any openings in the wellhead with silicone sealer or caulk to prevent the entry of dust, insects or other contaminants. |
|----|--|

- 24a Install a casing vent with a screened, downward facing opening. The screen needs to be 24-mesh, non-corrodible, and the down-turned opening should be at least 18-inches above the floor. Please see *Simple fixes For Wellhead Openings* at <http://www.doh.wa.gov/portals/1/Documents/pubs/331-232.pdf>.
- 61 The severe water hammer created when the pump shuts down poses an unreasonable risk to the reliability of the drinking water supply. Submit your plan to address this problem to DOH.

Significant Findings

Checklist # Corrective Action Needed within 45 days

- 27 Install a water-sampling tap downstream of S01 and before any form of treatment. You must be able to collect a raw water sample prior to entry to the distribution system to comply with the triggered source monitoring and the assessment source monitoring provisions of the Groundwater Rule.

The following observations are intended to notify you of other violations of drinking water rules.

Observations

Checklist # How to Comply

- 28 Well 1 (S01) is not currently equipped with a source meter. Operating a public water supply without a source meter, and without the valuable information provided by a meter, can be a significant detriment to system operation. A water system must to install a meter on each of its public water supply sources and record water production at least monthly (WAC 246-290-496). We recommend you record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns.

The following recommendations are intended to help improve your technical, managerial or financial capacity.

Recommendations

Checklist # Recommended Action

- 29 The well house has a hole in the roof. We recommend you improve the structural integrity of the well house. The structural integrity of the well house is important to the protection and maintenance of electrical and mechanical equipment essential to the proper functioning of your water system.
- 44 We recommend that you install a flow control device so that the flow through the UV unit doesn't exceed the rated capacity of the unit.
- We recommend that you install a UV transmittance sensor and solenoid valve so that the device will stop flow through the unit if the UV light fails.
- We recommend that you replace the UV light every 12 months.
- 87 The low-pressure condition in a portion of your distribution system has been referred to DOH for further follow-up.

I want to compliment you on the strength and effectiveness of your cross-connection control program, your distribution-system flushing program, and your compliance with drinking water sampling requirements. Congratulations!

By completing this sanitary survey, your water system met the requirements in WAC 246-290-416. The Office of Drinking Water will notify you of your next sanitary survey in three to five years. Please note that you should not interpret satisfying the requirements of a sanitary survey as meeting other applicable local, state or federal statutes, ordinances or regulations.

A sanitary survey is a fee-for-service activity (WAC 246-290-990). DOH will send you an invoice for \$600.

Thank you for your cooperation in the successful completion of the sanitary survey. If you have any questions or need additional information please call me at the number below.

Sincerely,

Samuel Clemens
Registered Sanitarian
Cascadia County Health Department
(555) 555-5556

Encl.: Completed sanitary survey checklist

Cc: Huck Finn, DOH Sanitary Survey Regional Lead

Appendix E

Sanitary survey checklist reference

Key to information presented in Appendix E:

Item #	The checklist question is copied here. Each item on the checklist has a corresponding page in Appendix E.
Guidance	Information designed to help the surveyor and the water system understand the context and meaning of the checklist item.
How to mark the checklist	This provides clarity on how to mark the item on the checklist.
Classification	The finding classification depends on how the surveyor marks the item on the checklist. Could be Significant Deficiency, Significant Finding, Observation, Recommendation, or Informational.
WAC reference	The Washington Administrative Code (WAC) requires all water systems to satisfy many items on the checklist. For these items, we list one or more WAC references here.
Publications	Links to DOH publications relevant to each checklist item are listed here. DOH has a database of hundreds of publications useful to purveyors. DOH encourages surveyors to use Appendix E to become familiar with the DOH publications associated with each checklist item, and provide relevant publications or their electronic links to water system staff during the survey or as a reference in the sanitary survey cover letter.
Webpage(s)	Links to DOH webpages relevant to the checklist item. DOH has many useful webpages. We encourage all surveyors to provide water systems with links to or printouts of webpages they might find beneficial.
Standard language	The standard language provides clear direction to the water system on what is required (in the case of significant deficiencies and significant findings) or expected (in the case of observations). The standard language also assists DOH staff track whether or not the purveyor met the requirement or expectation. We encourage all surveyors to use the standard language wherever possible. You should adjust the standard language as needed according to the context of each survey finding.
Other notes for the sanitary surveyor	This box is offers further background on the topic. The surveyor also can use it to record personal tips, lessons learned from other surveys, and important personal reminders.

APPENDIX E

Checklist Part A: Summary of significant deficiencies and significant findings

The text field for each line in the three sections of Part A is limited to 100 characters. We recommend you refer to the checklist item number for each significant deficiency and significant finding, and then refer to the survey cover letter for more information.

For example:

Significant deficiencies and significant findings identified during this sanitary survey:
Item 21. The wellhead is at risk of submergence. See cover letter.
Item 55. A water supply line is plumbed directly into a chemical tank. See cover letter.

We do not expect you to provide an explanation and give direction in Section A. You should include that information in the cover letter to the water system.

Checklist Part B: General water system description

Topics to describe in the comments section of Part B

Provide a general description of the water system including changes, updates, connections, source(s), storage, number of pressure zones, treatment, and control system(s) and alarm(s). Make corrections and updates to the purveyor's water facilities inventory form (WFI).

Checklist Part C: Operations and Management

Sanitary surveys have been an important part of our state drinking water program for decades. For most of this time, our focus has been on looking for visible infrastructure problems, like a hole in the well casing, a rip in the reservoir vent screen, or septic system too close to the well.

Recently we began to emphasize inquiry into operations and management issues: the way in which a small water system plans and allocates its resources; how prepared system staff are for the unexpected; and how proactive they are at preventing conditions that may lead to an unsafe or unreliable drinking water supply. This relatively new emphasis reflects the federal and state drinking water program priority to improve small water system technical, managerial and financial capacity.

For many surveyors, and small system operators and owners, an office discussion about budget, emergency response planning, or the importance of recordkeeping in a sanitary survey will feel new, and perhaps a bit awkward. After all, it's quite different from the more clinical study of infrastructure and its capacity to keep contaminants out of the drinking water supply. Our goal is to move the boundary against unsafe or unreliable drinking water from the infrastructure itself to the people who make decisions about infrastructure.

We intend to use of the O&M information surveyors collect to direct our small water system financial and managerial capacity efforts.

Topics to describe in the comments section of Part C:

The general level of planning and management documents developed by this water system and any recommendations for additional development, including updates, system management practices and processes, water rates, and so on.

Item 1	Community: Has the water system taken the online Capacity Assessment Survey?
Guidance	<p>This question applies only to community water systems with 1,000 or fewer connections. Section 3.3.3 will help you prepare to ask this question.</p> <p>You can get more information to prepare for this question at http://www.doh.wa.gov/CapacityAssessment.aspx</p>
How to mark the checklist	Mark as “Yes” or “No” depending on the water system’s response.
Classification	Recommendation if marked “No.”
WAC reference	None
Publications	<p><i>Water System Capacity</i> (331-283)</p> <p>http://www.doh.wa.gov/portals/1/Documents/pubs/331-283.pdf</p>
Webpage(s)	“Water System Capacity Assessment” at http://www.doh.wa.gov/CapacityAssessment.aspx
Standard language	We recommend you take the online capacity assessment . The assessment includes 18 questions about your system. When you complete the online assessment, you will get immediate feedback that provides tips and resources for improvement. We are using information from the assessment to target our limited technical assistance resources where we think they will be most beneficial.
Other notes for the sanitary surveyor	It is important to know whether the purveyor took the online capacity assessment. If the purveyor hasn’t completed the assessment, you should strongly recommend that they do so. Because questions may arise about the assessment tool, you should be familiar with its scope and purpose by reviewing the information on our Capacity Assessment webpage (see above).

Item 2	Were water system records available for your review?
Guidance	To prepare for this question, review the information in Section 3.1.1. We expect purveyors to make available information that supports the goals of the sanitary survey.
How to mark the checklist	Mark as “No” if important information necessary to achieve the objectives of the survey were not made available to you.
Classification	Observation if marked “No.”
WAC reference	WAC 246-290-416
Publications	<i>Sanitary Surveys of Drinking Water Systems</i> (331-197) http://www.doh.wa.gov/portals/1/Documents/pubs/331-197.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/SanitarySurveys.aspx
Standard language	Water systems must provide information in support of a thorough sanitary survey (WAC 246-290-416). You didn’t provide enough information to achieve the objectives of this sanitary survey. You must provide DOH with the information listed below. Based on the availability of this information to DOH and its content, there may be other sanitary survey follow-up tasks in addition to those already described in this letter. <i>(then list the requested information)</i>
Other notes for the sanitary surveyor	<p>When scheduling the survey, it is important to make it clear that records must be available for review as part of the survey (see Section 3.1.1). Confirm that the person you schedule the survey with—and describe the records needed—is someone who can make water system records available during the survey</p> <p>If records are not available because the system does not have any, note this as an observation that all water system are required to develop and implement a SWSMP.</p>

Item 3 and 3a	<p>Has the water system developed and implemented either a Small Water System Management Program or a Water System Plan?</p> <p>If no, are the following planning documents complete and up to date:</p>
Guidance	<p>Ask the water system staff to show you their current planning document. If the planning document appears complete or received DOH approval, check the completion date or approval date. If the completion or approval date is over 6 years past, or the system has undergone significant changes since completing the planning document, some elements of the planning document may need updating.</p> <p>Inform the operator that the planning document is the repository of the most basic policies, procedures, data, drawings, and financial information needed to keep the system operating properly under various circumstances, such as loss of use of facilities, reasonable financial contingencies, or loss of institutional knowledge due to the loss of the operator or key governing board members.</p> <p>Because a water system operates in a dynamic and changing world, it must amend its planning document from time to time.</p>
How to mark the checklist	<p>Mark Item 3 as “Yes” if DOH approved the water system’s planning document.</p> <p>Mark Item 3 as “Yes” if the SWSMP contains completed elements of each subject area listed in Item 3a.</p> <p>Mark Item 3 as “No” for any other answer, including evidence that the purveyor has made progress toward completing some or even many of the nine elements described in Item 3a. Then mark each answer under Item 3a. Look at the completed planning elements and check the appropriate box for each SWSMP element.</p>
Classification	Observation if Item 3 is marked “No”
WAC reference	WAC 246-290-100 and -105
Publications	<p><i>Planning requirements for public drinking water systems</i> (331-202) http://www.doh.wa.gov/portals/1/Documents/pubs/331-202.pdf</p> <p><i>Small Water System Management Program Guide</i> (331-134) for community systems http://www.doh.wa.gov/portals/1/Documents/pubs/331-134.doc</p> <p><i>Noncommunity Small Water System Management Program Guide</i> (331-474) for noncommunity systems http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-474.pdf</p>
Webpage(s)	<p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/PlanningRequirements.aspx</p> <p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/SmallWaterSystemMgmt/NCSWSMP.aspx</p>

Standard language	<p>If Item 3 is marked “No” and few, if any, planning elements are completed (Item 3a)</p> <p>Each water system must develop and implement a SWSMP if it hasn’t prepared a Water System Plan (WAC 246-290-105). Guidance on SWSMPs for community systems is in Small Water System Management Program Guide (331-134) and for noncommunity systems in Noncommunity Small Water System Management Program Guide (331-474). We designed this do-it-yourself guidance to help you complete the right management program for your system. If you need help, call our nearest regional office.</p> <p>Before developing your planning document, please ask our regional planner for guidance on the type of planning document to complete, and what to include in it.</p> <p>It’s likely the right planning document for your water system is a Small Water System Management Program (SWSMP), unless you plan to construct new facilities or expand your service area to serve additional customers. If you intend to expand your water system, the right planning document is a Water System Plan (WSP). Please contact the nearest DOH regional office to schedule a WSP pre-plan conference.</p> <p>For ease of use, you should set-up your SWSMP in a 3-ring binder with dividers for each of its elements. This document can be a powerful tool for keeping important documents preserved and indexed, and provides governing board members and the operator with information needed to remain in compliance and to protect public health when operations don’t go as expected. You don’t need to submit the SWSMP to DOH for review and approval at this time, but it should be available for review on request.</p>
Other notes for the sanitary surveyor	<p>The purpose of the Small Water System Management Program Guide (331-134) is to help owners and operators of small non-expanding Group A water systems meet the requirements of state and federal laws, and ultimately to protect the health of their customers.</p> <p>Much of the guide will be useful on a day-to-day basis. System personnel can use the guide as a filing system. Water systems that already have a SWSMP tell us that it can serve many purposes, such as providing a:</p> <ul style="list-style-type: none"> ▪ Central location for numerous water system records and system policies. ▪ Process to evaluate present and future system deficiencies and improvements necessary for continued water system operation. ▪ List of operation and maintenance duties that can be reviewed, used and improved as necessary by existing and future water system personnel so they may effectively manage and operate the water system. <p>In addition, by completing a SWSMP, the system will satisfy the Small Water System Management Program requirement in state rule (WAC 246-290-105) and the capacity requirement for water systems mandated in the federal Safe Drinking Water Act.</p>

Item 4	Does the water system plan to make capital improvements in the next 1-3 years?
Guidance	We would like to know if a water system is planning to make a significant investment into its water infrastructure. With this information, we can communicate with the system about funding options and their associated obligations.
How to mark the checklist	Mark as “Yes” if the water system plans something big within the next three years, such as constructing a new or replacement pipeline, constructing a new well or rehabilitating an existing well, installing treatment, constructing a new storage tank or rehabilitating an existing storage tank.
Classification	Informational
WAC reference	WAC 246-290-100, -105, -110, and -120
Publications	<i>Asset Management for Small Water Systems</i> (331-445) http://www.doh.wa.gov/portals/1/Documents/pubs/331-445.pdf <i>How to Hire an Engineer</i> (331-044) http://www.doh.wa.gov/portals/1/Documents/pubs/331-044.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemAssistance/DrinkingWaterStateRevolvingFundDWSRF.aspx
Standard language	None
Other notes for the sanitary surveyor	This information will be accessible to our State Revolving Loan Fund Program.

Item 5	Is there a backup operator available if the regular one is not available?
Guidance	Small water systems usually employ a single individual with primary operational responsibility. The daily involvement and after-hours availability of this operator (certified or not) is crucial to the safe and reliable delivery of drinking water. Absence due to illness, vacation, or other reason may expose the water system—and the public—to increased risk unless another qualified individual with a basic understanding of normal and emergency operational practices is available to fill in.
How to mark the checklist	Mark as “No” if the system does not designate a qualified individual to fill the operator role when the certified operator (or regular operator if this is a TNC system) is sick or on vacation.
Classification	Recommendation if marked “No.”
WAC reference	WAC 246-290-415 (5) WAC 246-290-420 (9) WAC 246-290-020 WAC 246-292
Publications	<i>Protecting Public Health: Requirements for Waterworks Operators</i> (331-466) http://www.doh.wa.gov/portals/1/documents/pubs/331-466.pdf <i>Owning and Managing a Drinking Water System</i> (331-084) http://www.doh.wa.gov/portals/1/Documents/pubs/331-084.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/WaterworksOperatorCertification.aspx Water Works Operator Certification, http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/Rules.aspx
Standard language	We recommend that you employ a Satellite Management Agency or a Contract Operator to fill a temporary absence of the operator. DOH can provide a list of qualified individuals.
Other notes for the sanitary surveyor	A “No” response to this question is aggravated by a “No” response on Item 3, failure to complete a small water system management program. No qualified back up operator combined with no written operations and emergency response plan creates increased vulnerability.

Item 6	Were the water system's current and future water quality monitoring requirements reviewed?
Guidance	We provide each Group A water system with the information needed to comply with its system-specific sampling requirements. We want to be sure the operator is aware of this information, understands it, and is committed to meeting all the sampling requirements
How to mark the checklist	Mark as "Yes" if you reviewed past water quality results (from pre-survey data packet) and future water quality monitoring requirements (from WQMR).
Classification	Informational
WAC reference	None
Publications	<p><i>General Sampling Procedure</i> (331-219) http://www.doh.wa.gov/portals/1/Documents/pubs/331-219.pdf</p> <p><i>Volatile Organic Chemical (VOC) Sampling Procedure</i> (331-220) http://www.doh.wa.gov/portals/1/Documents/pubs/331-220.pdf</p> <p><i>Inorganic Chemical (IOC) Sampling Procedure</i> (331-221) http://www.doh.wa.gov/portals/1/Documents/pubs/331-221.pdf</p> <p><i>Nitrate Sampling Procedure</i> (331-222) http://www.doh.wa.gov/portals/1/Documents/pubs/331-222.pdf</p> <p><i>Haloacetic Acid (HAA5) Sampling Procedure</i> (331-223) http://www.doh.wa.gov/portals/1/Documents/pubs/331-223.pdf</p> <p><i>Synthetic Organic Chemical (SOC) Sampling Procedure</i> (331-224) http://www.doh.wa.gov/portals/1/Documents/pubs/331-224.pdf</p> <p><i>Coliform Distribution System Sampling Procedure</i> (331-225) http://www.doh.wa.gov/portals/1/Documents/pubs/331-225.pdf</p> <p><i>Total Trihalomethane (TTHM) Sampling Procedure</i> (331-226) http://www.doh.wa.gov/portals/1/Documents/pubs/331-226.pdf</p> <p><i>Lead and Copper Sampling Procedure</i> (331-227) http://www.doh.wa.gov/portals/1/Documents/pubs/331-227.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/Contaminants.aspx
Standard language	None
Other notes for the sanitary surveyor	

Item 7	Were water quality sample results and trends reviewed with the water system staff?
Guidance	See section 3.3.2 when preparing for this discussion. Make a note on the checklist of an explanation offered for water quality trends shown (if any).
How to mark the checklist	Mark as “Yes” if recent water quality results were reviewed and trends (if any) were identified.
Classification	Informational
WAC reference	None
Publications	
Webpage(s)	
Standard language	None
Other notes for the sanitary surveyor	<p>Look for seasonality of nitrate and coliform results.</p> <p>Identify “outliers” that are grossly inconsistent with all other results.</p> <p>Document any suspected correlation between unusual result(s) and treatment status, climactic event, or exceptionally heavy water demand.</p> <p>Identify any trend of increasing nitrate levels and discuss SCA sources of contamination. If near trigger levels, explain possible consequences, including quarterly monitoring.</p> <p>Identify TC+ routine samples from a system with disinfection and discuss possible causes, sampling sites, treatment reliability, sample collection training, and so on.</p> <p>Note sources with elevated iron and manganese and discuss effects on water quality. Discuss distribution system main flushing, customer complaints, possible treatment options.</p>

Item 8	Does the system have emergency power?
Guidance	Portable or fixed-in-place generators or mechanical drive engines directly powering pumps can provide useful, and at times, critically important redundancy to an otherwise unreliable utility power supply.
How to mark the checklist	<p>Mark as “Yes” if the water system has a portable or fixed-in-place generator or a mechanical drive engine directly powering one or more of the pumps necessary to deliver water into the distribution system.</p> <p>Mark as “No” if the system has no emergency power source or uses a generator or mechanical drive as the primary source of energy to power pumps and other water infrastructure. In this case, document this fact in the comments section of Part C.</p>
Classification	Recommendation if marked “No.”
WAC reference	WAC 246-290-420
Publications	<p><i>Preparing Water Shortage Response Plans</i> (331-301) http://www.doh.wa.gov/portals/1/Documents/pubs/331-301.pdf</p> <p>For community systems: <i>Small Water System Management Program Guide</i> (331-134) See Section 1.6 http://www.doh.wa.gov/portals/1/Documents/pubs/331-134.doc</p> <p><i>Noncommunity Small Water System Management Program Guide</i> (331-474) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-474.pdf</p> <p><i>Emergency Response Planning Guide for Public Drinking Water Systems</i> (331-211) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-211.pdf</p> <p><i>Truck Transportation: Emergency water supply for public use</i> (331-063) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-063.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyPublicationsforWaterSystems.aspx
Standard language	We recommend that every water utility plan for the loss of power supply. Even during a power outage, a utility should be capable of maintaining a minimum level of service to its customers.
Other notes for the sanitary surveyor	<p>Surveyors can ask systems with frequent power outages whether they have considered emergency power. You could recommend that they investigate back-up power for improved reliability.</p> <p>Systems can install the electrical connection necessary for using a portable generator without installing the complete system with automatic switchover capability.</p> <p>You can recommend that the operator develop an Emergency Response Plan that includes planning for a power outage while protecting public health.</p>

Item 9	Does the system experience frequent power outages (>2 per year)?
Guidance	Unless the water system has elevated storage, a gravity source or an emergency intertie with another water utility, a power outage will result in loss of pressure in the distribution system. Discuss whether the system staff notifies DOH about a loss-of-pressure event (they should), and how they respond to the pressure loss (health advisory, flushing, disinfection, sampling?).
How to mark the checklist	Mark as “Yes” if the system suffered two or more power outages in either of the previous two years. Note in the comments section whether the system lost pressure during any of these power outages. A power outage is the result of any event in which a critical pump is denied the power it needs to adequately perform (such as a utility power outage, failure of the system’s power service due to a lightning strike, power overload, control system component failure, and so on).
Classification	Informational
WAC reference	WAC 246-290-420
Publications	<p><i>Preparing Water Shortage Response Plans</i> (331-301) http://www.doh.wa.gov/portals/1/Documents/pubs/331-301.pdf</p> <p>For community systems <i>Small Water System Management Program Guide</i> (331-134) See Section 1.6 http://www.doh.wa.gov/portals/1/Documents/pubs/331-134.doc</p> <p><i>Noncommunity Small Water System Management Program Guide</i> (331-474) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-474.pdf</p> <p><i>Emergency Response Planning Guide for Public Drinking Water Systems</i> (331-211) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-211.pdf</p> <p><i>Truck Transportation: Emergency water supply for public use</i> (331-063) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-063.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyPublicationsforWaterSystems.aspxv
Standard language	None
Other notes for the sanitary surveyor	

Item 10	Does the system experience frequent water outages (>2 per year)?
Guidance	Any water outage creates an opportunity for contaminants to backflow or back-siphon into the distribution system. If the water system doesn't take proper measures, this contamination will reach consumers after the water system restores water service.
How to mark the checklist	Mark as "Yes" if the water system suffered two or more water outages in either of the previous two years. A water outage is a loss of pressure in the distribution system, caused by power outage, line break, depleted source or storage, control system failure, or other reasons.
Classification	Informational
WAC reference	WAC 246-290-420 WAC 246-290-451 (1)
Publications	<p><i>Responding to Pressure Loss</i> (331-338) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-338.pdf</p> <p><i>Guidance Document Preparing Water Shortage Response Plans</i> (331-301) http://www.doh.wa.gov/portals/1/Documents/pubs/331-301.pdf</p> <p><i>Guidance Document Water Shortage Response Plan for Small Public Drinking Water Systems</i> (331-316) http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyPublicationsforWaterSystems/WaterShortageResponsePlans.aspx</p> <p><i>Water Shortage</i> (331-463) http://www.doh.wa.gov/portals/1/Documents/pubs/331-463.pdf</p> <p><i>Department of Health's role during a drought emergency</i> (331-297) http://www.doh.wa.gov/portals/1/Documents/pubs/331-297.pdf</p> <p><i>Emergency drinking water sources</i> (331-317) http://www.doh.wa.gov/portals/1/Documents/pubs/331-317.pdf</p> <p><i>Emergency Funding for Water Systems</i> (331-420) http://www.doh.wa.gov/portals/1/Documents/pubs/331-420.pdf</p>
Webpage(s)	<p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyPublicationsforWaterSystems.aspx</p> <p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyPublicationsforWaterSystems/WaterShortageResponsePlans.aspx</p>
Standard language	None
Other notes for the sanitary surveyor	

Item 11	Does there appear to be adequate reliability provided for this system?
Guidance	Repeated power or water outage for the same or similar reason is a sign of negligent or ineffective management and planning.
How to mark the checklist	Mark as “No” if the system has received complaints of frequent water outages, experienced a large number of line breaks, or lost service for any reason that you believe is the result of poor management and planning.
Classification	Observation if marked “No.”
WAC reference	WAC 246-290-415 (2) WAC 246-290-415 (5) WAC 246-290-420
Publications	<i>Responding to Pressure Loss</i> (331-338) http://www.doh.wa.gov/portals/1/Documents/pubs/331-338.pdf <i>Water System Design Manual</i> (331-123) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-123.pdf (See the Preface, and Sections 5.7 and 7.7)
Webpage(s)	
Standard language	All public water systems must provide reliable water service (WAC 246-290-420). The water system suffers from repeated water outages because of _____. Please submit to DOH your plan to address the poor reliability of operations. Until you have this problem solved, follow the guidance in <i>Responding to Pressure Loss</i> (331-338). Anytime an event results or is expected to result in pressure loss in the distribution system, contact the DOH regional office as soon as possible after taking measures to protect the health of your customers and prevent damage to your water infrastructure.
Other notes for the sanitary surveyor	“All public water systems shall provide an adequate quantity and quality of water in a reliable manner at all times consistent with the requirements of this chapter” (WAC 246-290-420).

Checklist Part D: Sources

Sources constitute the largest part of the checklist, and include the largest number of potential significant deficiencies and significant findings. A WFI collects more data about the source of supply than about any other part of a water system. A significant portion of federal and state rules are devoted to establishing the criteria for collecting samples from a particular source, in order to demonstrate it's safe to use as a public drinking water supply. All this attention to sources reflects the obvious importance sources have to the water system's capacity to maintain a safe and reliable drinking water supply to all its customers.

Unless the source is a spring on a hillside, or a powerful artesian well, each source of supply comes with a pump. Many sources of supply also come with some form of treatment, such as adding chlorine (for disinfection). *Pumps* and *Treatment* have their own part on the checklist.

An understanding of the source's construction, setting among potential sources of contamination, the degree to which the source responds to a range of climactic conditions (floods, drought), and threats to its physical availability (power, pump, and structural failure) tells us a great deal about the relative safety and reliability of the whole drinking water system.

It is not acceptable for water systems to run out of water. The main job of a water system's source(s) is to provide a continuous supply of water capable of meeting the maximum daily demand of the water system, even if that level of demand occurs only a few times each year.

In most cases, sources also pressurize the distribution system. The level of pressure added to the source water is a function of the difference in elevation between the pumping level of the source water and the ground surface at the source, the rate of flow, the elevation of customers above the source, and the "residual" pressure necessary to meet customers' expectations when they turn on their faucets. State standards require that the "residual" pressure be at least 30 psi, except under fire flow conditions.

Use the space after question 40 to describe and evaluate the source type, facilities (including maintenance, operations, sanitary and security observations), and any major changes to the source such as pump replacement, deepening or reconstruction.

Topics to describe in the comments section of Part D:

- Describe sources and how they function (well pump condition and controls).
 - Include emergency source
 - Include intertie(s) and intertie agreement(s)
- Approval status.
- Describe the well house structure.
- Describe the SCA for the sources and the source susceptibility. Describe any concerns in comments below. Also, pay attention to the generator fuel source. Is containment adequate?
- If the system does not have a well log, what information is known about the source?
- Explain how often the system measures the water level.

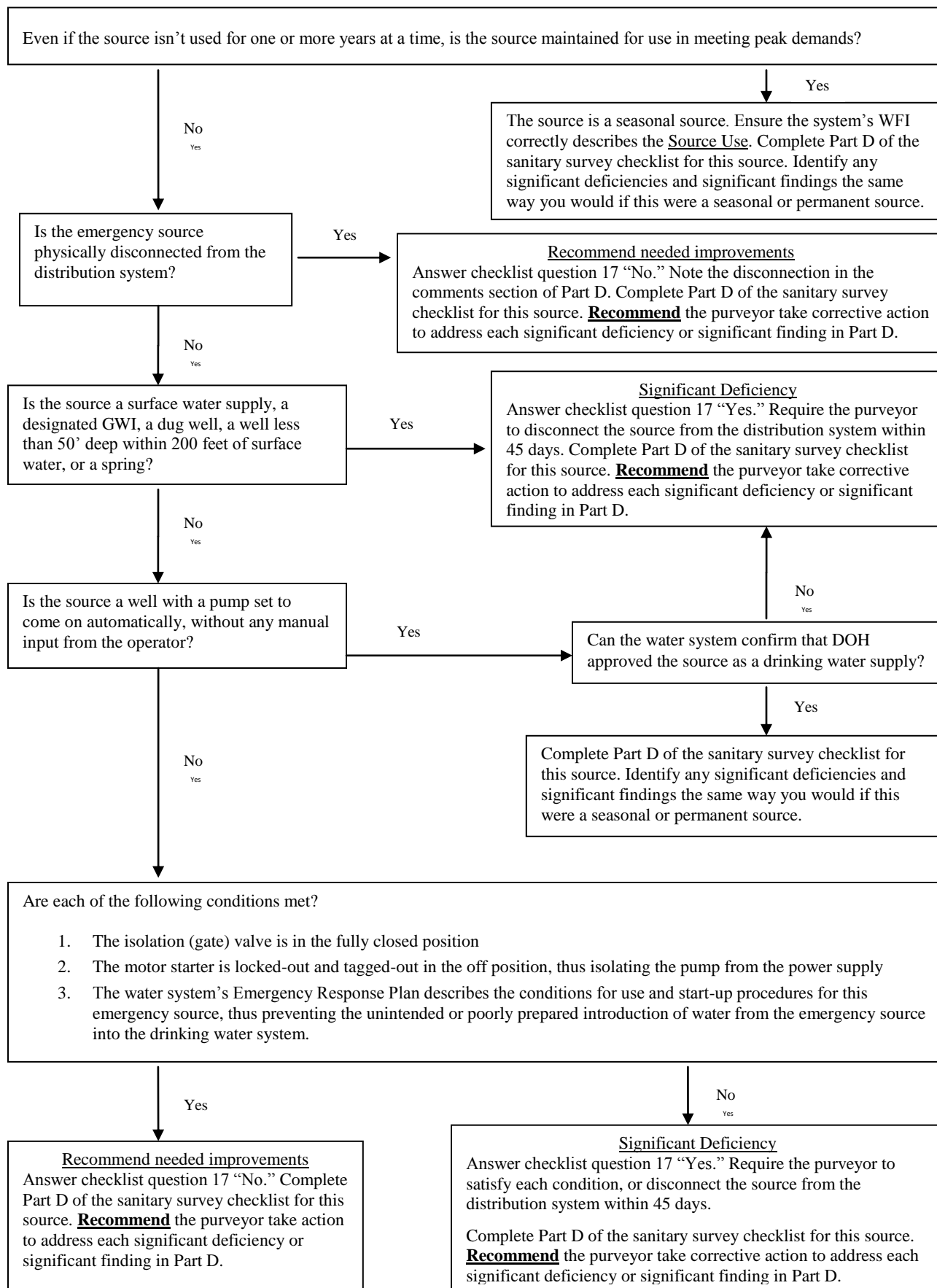
Item 12 and 12a	Did you observe a source connected to the water system that is NOT listed on the WFI and in active use? If yes, has the source received written DOH approval?
Guidance	<p>This two-part question is really aimed at identifying a source that is used as a seasonal or permanent source, that is not listed on the WFI, and is unapproved by DOH.</p> <p>The second part of this question reflects the possibility that a permanent or seasonal source exists, is in active use status and has our approval, but for some reason it was not added to the WFI.</p>
How to mark the checklist	<p>Mark Item 12 as “Yes” if you observe a source connected to the water system that is not listed on the WFI and is in active use. Active use means a source that’s operating, or is meant to operate under a programmed set of conditions (low pressure, low reservoir level).</p> <p>Mark Item 12a as “No” if you learn from DOH that the source hasn’t received written DOH approval. Surveyors should check with DOH on source approval status before completing the sanitary survey cover letter and checklist.</p>
Classification	Item 12a - Significant deficiency if marked “No.”
WAC reference	<p>WAC 246-290-110, 120, 130(1)</p> <p>WAC 246-290-415 (5)</p>
Publications	
Webpage(s)	
Standard language	Immediately discontinue use of the unidentified source. Physically disconnect the source from the distribution system and contact the DOH regional engineer for further information on obtaining source approval.
Other notes for the sanitary surveyor	<p>WAC 246-290-130(1) states:</p> <p>No new source, previously unapproved source, or modification of an existing source shall be used as a public water supply without DOH approval. No intake or other connection shall be maintained between a public water supply and a source of water not approved by the department.</p>

Item 13 14, 15, 16	DOH source number and source use
Guidance	The checklist requires the surveyor to identify the well by source number (SO#). Refer to the WFI for source number. The source number is not necessarily the well number assigned by the water system (Well #2 could be designated as S03).
How to mark the checklist	Not applicable
Classification	Informational
WAC reference	246-290-480(a)(i)
Publications	The criteria for designating a well field are on Page 201 of the <i>Water System Design Manual</i> (331-123). http://www.doh.wa.gov/portals/1/Documents/pubs/331-123.pdf
Webpage(s)	
Standard language	
Other notes for the sanitary surveyor	<p>If the source is a well field made up of two or more wells, each well in the well field should be assigned a separate source number on the WFI. You should mark the checklist with the individual well source number if the well is part of a well field.</p> <p>You should confirm that the minimum criteria for designating a well field are met. If the criteria are not all met, note that on the checklist.</p> <p>Three different designations are used to identify the sources:</p> <ul style="list-style-type: none"> • Source number (such as “S02”). • Source name the water system assigned to the source (such as “Well #2”). • Well tag assigned by the Department of Ecology <p>If you believe a source has been a misidentified, take photos of the well tag and well locations, make a note on the WFI of the changes, and be sure to speak with our regional office.</p> <p>Status is another attribute of a drinking water source. You may encounter three types of source status:</p> <ol style="list-style-type: none"> 1. Pre-Active: The source is approved, but it hasn’t been put into service yet. 2. Active: The source is in active service. Active status can apply to any type of source use (permanent, seasonal, or even emergency use). 3. Inactive: The source was taken out of service. When a system takes an active source out of service, the source use remains the same (for example, “permanent”) while the source status changes from “active” to “inactive.” <p>If a source status is pre-active or inactive, it will show up after the source name in column 16 on the WFI. For example, “Beech Street Well (inactive).”</p> <p>We will not enforce a directive to decommission a well unless the inactive well is a contaminant threat to an active permanent or seasonal drinking water source. You may direct the water system to decommission an inactive well if your local ordinance gives you that authority.</p>

Item 17	If this is an emergency source, should it be disconnected?
Guidance	<p>This question requires a good deal of explanation. To start, you should inspect all emergency sources as part of a sanitary survey with the exception of an emergency intertie with another public water system.</p> <p>We want to know whether any physically connected emergency source needs to be physically disconnected. Under the “standard language” section below, we list the criteria that would prompt us to take steps to ensure physical disconnection.</p>
How to mark the checklist	<p>If the emergency source already is physically disconnected, mark as “No.” Note the physical disconnection in the comments section for Part D. If the source is not an emergency source, mark as “NA.”</p> <p>If the emergency source is physically connected, review the attached <i>Emergency Source Significant Deficiency Decision Path</i> to determine whether the physical connection is a significant deficiency. If so, mark as “Yes” and describe why the source must be physically disconnected (see standard language below).</p>
Classification	Significant deficiency if marked “Yes.” See the <i>Emergency Source Significant Deficiency Decision Path</i> on Page 60.
WAC reference	<p>WAC 246-290-001 (2)</p> <p>WAC 246-290-130</p> <p>WAC 246-290-132</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Emergency Drinking Water Sources</i> (331-317)</p> <p>http://www.doh.wa.gov/portals/1/Documents/pubs/331-317.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyPublicationsforWaterSystems.aspx
Standard language	<p>If the emergency source is a surface water supply, a designated GWI, a dug well, a well less than 50 feet to the first open interval located within 200 feet of surface water, or a spring:</p> <p>Physically disconnect the emergency source from the distribution system and provide DOH with electronic photographs confirming the physical disconnection. Contact DOH for requirements you must meet to reconnect the source.</p> <p>If the emergency source is a well that doesn’t meet the three conditions for remaining physically connected (see Emergency Source Significant Deficiency Decision Path on Page 60):</p> <p>Submit proof that the emergency source meets each of the three conditions listed below, or physically disconnect the emergency source from the distribution system and provide DOH with electronic photographs confirming the physical disconnection. Contact DOH for requirements you must meet to reconnect the source.</p> <ol style="list-style-type: none"> 1. The isolation (gate) valve is in the fully closed position. 2. The motor starter is locked-out and tagged-out in the off position, thus isolating the pump from the power supply. 3. The conditions for use and start-up procedures for this emergency source are in the water system’s Emergency Response Plan, thus preventing unintended or poorly prepared introduction of water from the emergency source into the drinking water system.

Other notes for the sanitary surveyor	<p>An emergency source benefits a water system by providing ready stand-by capacity to meet unanticipated water supply needs. An emergency source meets these attributes:</p> <ol style="list-style-type: none"> 1. A designated “emergency source” is one that is not necessary to meet the system’s maximum daily demand (MDD) and peak hourly demand (PHD) under 30 psi while all permanent and seasonal source(s) of supply are in service. 2. A designated “emergency source” is intended to address the following off-normal events: <ol style="list-style-type: none"> i. Temporary failure of one or more nonemergency sources where the remaining sources of supply cannot maintain 20 pounds per square inch (psi) during PHD throughout the water distribution system. ii. Fire where the fire suppression requirement (flow rate and duration) combined with MDD cannot be met by the purveyor while maintaining positive pressure throughout the distribution system. <p>Elements of the water system’s emergency response plan that touch on emergency sources should:</p> <ul style="list-style-type: none"> • Include source name, DOH source number, capacity, and location. • Identify who in authority will decide to start the source. • Describe the conditions in which the source would be started. • Describe the operational steps that should be taken to start the source, such as checking water level, flushing, disinfection, changing valve position, and so forth. • Describe the minimum water quality sampling that will be done before starting the source. • Describe the public notification steps that will be taken, and the need to notify DOH that the emergency source is in operation. • Describe the on-going care and maintenance of the emergency source, so that it is functional and available when needed, such as flushing to waste, sampling, lubrication, and so forth.
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Emergency Source Significant Deficiency Decision Path



Item 18	Is the source a potential GWI source?
Guidance	A well is a potential groundwater under the direct influence of surface water (GWI) if it is located within 200 feet of surface water and the depth to the first opportunity for water to enter the well casing (top of casing perforations or top of well screen) is 50 feet below ground surface or less. Every spring is a potential GWI.
How to mark the checklist	Mark as “Yes” if the source is a spring or the source is a well within 200 feet of surface water and you know the depth to the first open interval is less than 50 feet below ground surface. The regional office will refer all checklists marked “Yes” to the regional GWI program lead to ensure that the source had the appropriate GWI evaluation.
Classification	If marked “Yes,” this will be referred to the DOH regional office GWI program lead.
WAC reference	WAC 246-290-010 WAC 246-290-640
Publications	<i>Groundwater Sources Under the Direct Influence of Surface Water (GWI)</i> http://www.doh.wa.gov/portals/1/Documents/pubs/331-216.pdf <i>Potential GWI Sources-Determining Hydraulic Connection Through Water Quality Monitoring</i> http://www.doh.wa.gov/portals/1/Documents/pubs/331-230.pdf <i>Potential GWI Sources--Microscopic Particulate Analysis</i> http://www.doh.wa.gov/portals/1/Documents/pubs/331-231.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/SourceWater/GWIProgram.aspx
Standard language	Well # (S0#) appears to meet the definition of a potential groundwater under the influence of surface water (GWI). You will need to take S0# through DOH’s GWI evaluation program if you haven’t already done so. If necessary, DOH will contact you with further information on the GWI evaluation process.
Other notes for the sanitary surveyor	If you observe a well to be less than 200 feet from surface water, you must then know whether the depth to the first open interval is less than 50 feet below ground. If a well log is unavailable, you should note the need for us to follow-up with the water system on determining the depth to the first open interval.

Item 19	Is the Sanitary Control Area (SCA) free of unmitigated potential sources of contamination?
Guidance	<p>If you observe a potential contaminant threat within the sanitary control area (SCA), it's important to determine whether the threat has been evaluated.</p> <p>Therefore, before the survey, review the previous sanitary survey letter and checklist to determine whether the last surveyor identified any potential source of contamination in the SCA. If so, during the current survey, find out whether the purveyor removed the contamination source, developed a DOH-approved mitigation plan, or got DOH approval to reduce the SCA (WAC 246-290-135).</p> <p>Potential threats include a sanitary sewer, septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, roadway drainage swale, nearby surface water, fuel or chemical storage, or fuel pipelines.</p> <p>If you observe that the system failed to take the steps required in the last survey, or currently fails to maintain mitigation, the failure is a SIGNIFICANT DEFICIENCY. In addition, any new (previously unrecorded) potential contaminant threat is a SIGNIFICANT DEFICIENCY.</p>
How to mark the checklist	<p>Mark as "Yes" if there are no potential sources of contaminant within 100 feet of the well.</p> <p>Mark as "Yes" if there are potential sources of contamination, but you are certain that the purveyor appropriately mitigated the threat or DOH has approved a reduction in the SCA.</p> <p>Mark as "No" for all other circumstances. All "No" answers will trigger a DOH file review before completing the cover letter. The review will determine whether there is any history of a mitigation plan approval (including the need for treatment), or past approval of a reduction in the SCA.</p>
Classification	Potential significant deficiency if marked "No," subject to file research and DOH confirmation before completing the cover letter.
WAC reference	<p>WAC 246-290-135</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Source Water Protection Requirements</i> (331-106) http://www.doh.wa.gov/portals/1/Documents/pubs/331-106.pdf</p> <p><i>Wellhead Protection Program Guidance Document</i> (331-018) http://www.doh.wa.gov/portals/1/Documents/pubs/331-018.pdf</p> <p><i>Sanitary Control Area Protection</i> (331-453) http://www.doh.wa.gov/portals/1/Documents/pubs/331-453.pdf</p> <p>Ecology's <i>Surface Seals – Problems and Solutions</i> (96-br-099) https://fortress.wa.gov/ecy/publications/summarypages/96br099.html</p>
Webpage(s)	<p>Source water protection http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/sourcewater/SourceWaterProtection.aspx</p> <p>Well logs: http://apps.ecy.wa.gov/welllog/</p>
Standard language	<p>For a biological contaminant hazard that cannot be removed easily (sewer line, septic tank, drain field, irrigation canal or other surface water, waste lagoon, manure pile)</p> <p>[Name the biological hazard(s)] is/are present in the sanitary control area of Well <u> X </u> (S0<u> X </u>). Please submit a scaled map showing all buildings and potential sources of contamination located within 100 feet of the well. Include all known information about the type, size, depth, and other construction details of the potential contaminant source. Also, include a</p>

	<p>copy of the well log showing the construction details for the well. Based on the information submitted, DOH will contact you about further follow-up actions that may be required.</p> <p>For a biological contaminant hazard that can be moved or removed (portable toilet, manure pile)</p> <p>Remove the (name the item here) to a distance greater than 100 feet from Well <u>X</u>.</p> <p>For a chemical contaminant hazard that cannot be easily moved or removed (buried fuel tank or fuel lines, above ground bulk fuel or chemical storage)</p> <p>Please submit a scaled map showing all buildings and potential contamination sources located within 100 feet of the well. Include all known information about the type, size, depth and other construction details of the potential contaminant source, including any mitigating design features such as existing spill containment, double-wall construction and so on. Also, include a copy of the well log showing the construction details for the well. Based on the information submitted, DOH will contact you about further follow-up actions that may be required.</p> <p>For a chemical contaminant hazard that can be moved or removed (household chemicals, fuel cans, pesticides)</p> <p>Remove the [name the chemical hazard(s) here] to a distance greater than 100 feet from Well <u>X</u>.</p>
Other notes for the sanitary surveyor	<p>Not all potential contamination sources have the same priority. Moreover, many potential contaminant threats are not significant deficiencies.</p> <p>To illustrate this point, we begin with the most serious threats to health: microbiological contaminants. A surveyor should identify sanitary sewers (especially old clay or concrete sewer lines), septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, roadway drainage swale, or surface water within 100 feet of a well as significant deficiencies.</p> <p>Find out whether the purveyor has DOH approval to mitigate or reduce such threats in the SCA. If not, we will require the purveyor to eliminate these contaminant sources from the SCA, or to demonstrate that it mitigated the threat appropriately. Treatment to 4-log virus inactivation of the source is also an option for addressing SCA violations (WAC 246-290-451).</p> <p>At the other end of the spectrum is an occasional application of glyphosate (Round-up) for weed control or the presence of a parked car, which may leak motor oil or other engine fluids. These are chronic contaminants that source chemical sampling would detect, and don't pose an immediate risk to health. If the scale of the potential threat is small, you should mark this checklist item as "Yes," but add comments about what you observed and why you believe it possess a minor risk to the safety of the water supply. (Is it one car or 50 junk cars near the well? Is the area treated and amount of weed killer used small or is it applied on an industrial scale?)</p>

Item 20	Is the wellhead located in a pit or vault?
Guidance	Wells should be constructed so that the top of the casing is at least 6-inches above the floor or finished ground surface. Grading should direct water <i>away</i> from the wellhead.
How to mark the checklist	Mark as “Yes” if the well is in a below-grade vault or pit.
Classification	Recommendation if marked “Yes.”
WAC reference	WAC 173-160 (state well construction standards) WAC 246-290-130
Publications	Ecology’s <i>Surface Seals – Problems and Solutions</i> (96-br-099) https://fortress.wa.gov/ecy/publications/summarypages/96br099.html
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/sourcewater/SourceWaterProtection.aspx
Standard language	We recommend that the purveyor extend the well casing to at least 12 inches above the pump house floor or finished grade the next time the well pump is pulled for maintenance or replacement.
Other notes for the sanitary surveyor	

Item 21	Is the wellhead at risk of submergence?
Guidance	A well is at risk of submergence if it is located in the flood plain, in a below-grade vault or pit without drain or sump pump of adequate capacity to discharge leakage, in the direct path of surface water run-off, or any other circumstance where the top of the well casing is at risk of being submerged.
How to mark the checklist	Mark as “Yes” if any of the conditions described in the “standard language” section exist.
Classification	Significant deficiency if marked “Yes”
WAC reference	WAC 246-290-135 WAC 246-290-415 (5) WAC 173-160-291 (Standards for water well construction)
Publications	Ecology’s <i>Surface Seals – Problems and Solutions</i> (96-br-099) https://fortress.wa.gov/ecy/publications/summarypages/96br099.html
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/sourcewater/SourceWaterProtection.aspx
Standard language	<p>If the wellhead is in a pit and there is no drain to daylight and no sump pump with the capacity needed to keep the wellhead from becoming submerged if a pipe leaks:</p> <p>Please submit you plan to ensure the wellhead is not at risk of submergence due to high groundwater, run-off into the pit, or pipe leakage. Your plan may include: 1) Extend the well casing so that the top of the casing is at least 6 inches above surrounding grade; 2) Install a drain to daylight capable of discharging by gravity the full flow of the well pump before water rises above the well casing; or 3) Install a sump pump capable of discharging the full flow of the well pump before water rises above the well casing.</p> <p>If the well is in the path of surface run-off that could submerge the top of the well casing:</p> <p>Please submit a re-grading plan for the area surrounding the well so that water does not collect and pond at the wellhead, and if necessary extend the well casing so that it is at least 6 inches above the finished grade.</p> <p>If the well is located in the flood plain:</p> <p>Please submit a plan to ensure the wellhead is not at risk of submergence due to flooding. Your plan may include: 1) Extend the well casing so that it is at least 24 inches above the 100-year flood elevation and 6 inches above grade; or 2) relocate the well.</p>
Other notes for the sanitary surveyor	<p>If the wellhead is located down in a vault or pit, it must drain to daylight or be equipped with an appropriately sized sump pump. The risk of submergence may be due to a leak in the well pump discharge piping, high groundwater conditions or surface water flow into the below-grade structure. The daylight drain and pump must be large enough to discharge sufficient flow to ensure the wellhead is not submerged.</p> <p>To prevent the water level in the pit or vault from rising above the top of the well casing and threatening the water quality in the well, the drain must be big enough, and installed with enough slope, to discharge a significant portion of the well capacity. The drain outfall must provide unrestricted discharge. We recommend putting a screen on the pit or vault drain.</p> <p>Look for telltale signs of past flooding or evidence of surface water run-off that may submerge the top of the well casing. If the well casing extends above the ground or finished floor by only a few inches, look for conditions that could lead to submergence of the top of the well casing.</p>

Item 22	Is the well cap sealed, watertight and free of unprotected openings?
Guidance	Look for missing bolts or a loose-fitting well cap, a missing plug in the well cap, or a crack in the well cap.
How to mark the checklist	Mark as “Yes” if the well cap is water tight, undamaged, properly fitted and correctly installed.
Classification	Significant deficiency if marked “No.”
WAC reference	WAC 246-290-130 WAC 246-290-135 WAC 246-290-415 (5)
Publications	<i>Simple Fixes for Wellhead Openings</i> (331-232) http://www.doh.wa.gov/portals/1/Documents/pubs/331-232.pdf Ecology’s <i>Well Caps: Problems and Solutions</i> (96-br-098) https://fortress.wa.gov/ecy/publications/summarypages/96br098.html
Webpage(s)	
Standard language	<p>If the well cap is damaged or ill-fitting:</p> <p>Replace the well cap with one from the list of approved well caps. See Pitless Adapters, Pitless Units, and Well Caps Policy¹¹ M.01.</p> <p>If the well cap can be repaired or sealed:</p> <p>Seal any openings in the wellhead with silicone sealer or caulk to keep dust, insects, or other contaminants out.</p>
Other notes for the sanitary surveyor	The well cap should come from a listed manufacturer of approved well caps. See DOH’s Pitless Adapters, Pitless Units, and Well Caps Policy ¹² M.01.

¹¹ <http://www.doh.wa.gov/portals/1/documents/4200/p-m01.pdf>

¹² Same

Item 23	Is the well casing free of any unprotected openings?
Guidance	Inspect the well casing for holes and cracks of any size.
How to mark the checklist	Mark as “Yes” if there are no cracks or other openings that allow contaminants to enter through the well casing.
Classification	Significant deficiency if marked “No.”
WAC reference	WAC 246-290-130 WAC 246-290-135 WAC 246-290-415 (5)
Publications	Simple Fixes for Wellhead Openings (331-232) http://www.doh.wa.gov/portals/1/Documents/pubs/331-232.pdf
Webpage(s)	
Standard language	Seal any openings in the wellhead with silicone sealer or caulk to keep dust, insects, and other contaminants out.
Other notes for the sanitary surveyor	<p>Wells located in areas at risk of being struck by vehicles may have underground damage to the casing. If you find evidence of physical damage, you may recommend further investigation by the operator.</p> <p>Wells developed as pitless units may have a dislodged discharge pipe or a corroded connection creating an opening in the casing. A well professional should exam pitless unit wells with wet areas or significant sunken ground around the casing.</p> <p>Dug wells do not have “casings” like drilled wells, but the sanitary risk is the same. Inspection ports may be available for the surveyor to see the interior walls of the well. Improperly sealed concrete rings may allow water above the aquifer to infiltrate. This is not an acceptable design.</p>

Item 24 and 24a	<p>Is there a vent on the well?</p> <p>If yes, is the vent protected? (24-mesh screen or slots)</p>
Guidance	Every well casing should have a vent to maintain atmospheric pressure inside the well casing during pump operation and shutdown. To keep contaminants out of the public drinking water supply, the casing vent must be constructed and screened to prevent contaminants from entering the well casing. Every vent must have non-corrodible 24-mesh (insect) screen securely placed over the end of the vent.
How to mark the checklist	Mark Item 24a as “Yes” if the well casing vent is constructed and screened to prevent contaminants from entering the drinking water supply.
Classification	<p>If the answer to Item 24 is “No,” skip Item 24a.</p> <p>Recommendation if Item 24 marked “No.”</p> <p>Significant deficiency if Item 24a marked “No.”</p>
WAC reference	<p>WAC 246-290-130</p> <p>WAC 246-290-135</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Simple Fixes for Wellhead Openings</i> (331-232)</p> <p>http://www.doh.wa.gov/portals/1/Documents/pubs/331-232.pdf</p>
Webpage(s)	
Standard language	<p>Item 24 marked “No”: Most well casings need a casing vent to allow air to enter and exit as the water level in the well changes. Consult with DOH on how to provide proper venting for your well.</p> <p>Item 24a marked “No”: Install a casing vent with a screened, downward facing opening. The screen needs to be 24-mesh, non-corrodible, and the down-turned opening should be at least 18-inches above the floor. Please see <i>Simple Fixes for Wellhead Openings</i> (331-232).</p>
Other notes for the sanitary surveyor	<p>Some wells use a pitless adapter to discharge water underground from the pump to the distribution system.</p> <p>Vents may be on the underside or top of watertight pitless unit caps. If there is no vent, the well will draw air in through any available opening, seam, electrical conduit or other hole. These improperly protected openings are not acceptable.</p> <p>Some wells discharge through the top of the well. Those wells use a well seal, which has a rubber seal inside the casing. When the bolts that secure the two cast iron halves are tightened together, the rubber seal expands out against the casing and around the outside of the pump discharge pipe. The well seal has a threaded plug that allows installation of a gooseneck (downward-facing) vent.</p> <p>Surveyors should have a mirror with them to examine the underside of pitless unit caps.</p>

Item 25	Are conduits and junction boxes sealed to prevent contaminant entry?
Guidance	<p>On outdoor wells, you may observe broken conduits where the electrical power supply rises from below grade and enters the underside of the well cap. The breaks usually result from ground settlement. The broken conduit provides an access point for contaminants to enter the well.</p> <p>Indoor wells have electrical conduits and junction boxes to supply the well pump with power. Openings in a junction box or conduit provide access for contaminants to enter the well.</p>
How to mark the checklist	Mark as “Yes” if the electrical conduits and associated junction boxes connected to the well are constructed and maintained to prevent contaminants from entering the drinking water supply.
Classification	Significant deficiency if marked “No.”
WAC reference	<p>WAC 246-290-130</p> <p>WAC 246-290-135</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Simple Fixes for Wellhead Openings</i> (331-232)</p> <p>http://www.doh.wa.gov/portals/1/Documents/pubs/331-232.pdf</p>
Webpage(s)	
Standard language	Repair and seal any openings in electrical conduits and junction boxes connected to the well casing, as needed, to keep insects, rodents, or other contaminants out of the public drinking water supply.
Other notes for the sanitary surveyor	<p>Mice can move easily inside the electrical conduit.</p> <p>Indoors, purveyors sometimes don’t properly seal openings when installing or maintaining electrical junction boxes. An opening in the junction box leading from the motor starter to the top of the well may give rodents easy access to enter and nest, sometimes right over the well casing itself (the location of the last J-box before power enters the well casing).</p> <p>Surveyors should inspect every J-box all the way back to the electric service panel.</p>

Item 26	Is the well unreasonably at risk to physical damage?
Guidance	Even the slightest bump from a heavy object (a vehicle) may cause a well casing to move out of alignment or crack. Such a bump also could cause the casing's annular seal to fail or the well discharge piping to leak. We expect the surveyor to evaluate the relative risk that a vehicle, machinery or natural causes (rockslide, mudslide, avalanche) could damage the wellhead.
How to mark the checklist	Mark as "No" if you believe the well location is reasonably protected from physical damage by vehicle, machinery or natural causes.
Classification	Significant finding if marked "Yes."
WAC reference	WAC 246-290-135 WAC 246-290-415 (5)
Publications	
Webpage(s)	
Standard language	Install signs, posts, bollards or other protective structure around the well to protect it from damage by vehicles, equipment or machinery.
Other notes for the sanitary surveyor	<p>Examples of unreasonable risk to damage include a well:</p> <ul style="list-style-type: none"> • In or immediately next to a parking area. • Located where vehicles travel or machinery is used. • In a field where large farm equipment is used. • In a vault without a traffic-rated cover located in or immediately next to roadway. • At the base of an unstable slope. <p>Will the well be visible after a snowstorm? To what degree will snow obstruct the view?</p>

Item 27	Is there a raw-water source sample tap?
Guidance	Every well must have a sample tap before any form of treatment. The raw-water tap allows an operator to take a “triggered” source sample in compliance with the Groundwater Rule. The GWR sample tap cannot be downstream of any form of treatment, and must be located prior to entry to the distribution system.
How to mark the checklist	Mark as “Yes” if there is a raw water sample tap.
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-320 WAC 246-290-415 (5)
Publications	Groundwater Rule: Source Water Sample Taps (331-436) http://www.doh.wa.gov/portals/1/Documents/pubs/331-436.pdf .
Webpage(s)	
Standard language	Install a water sampling tap downstream of S0_ and before any form or treatment. You must be able to collect a raw-water sample prior to entry to the distribution system to comply with the Groundwater Rule, which requires triggered source monitoring and assessment source monitoring.
Other notes for the sanitary surveyor	<p>Systems that have sources without any treatment should use this same “raw water” sample tap to conduct all source chemical sampling (volatile organics, inorganics).</p> <p>The operator should not use a sample tap not under the direct control of the water system as the raw water sample tap.</p> <p>A sample tap at or within 12 inches of the floor or ground is vulnerable to contamination. It is too close to contaminated surfaces; any water, cleaning products or other sprays directed at the surfaces may splash back to the tap.</p> <p>Let the water system know that they may not install a yard hydrant that drains the riser into the ground. The weep hole presents a risk of contamination to the distribution system through a cross connection with contaminated groundwater. If the water system considers using a yard hydrant as a sample tap, the Uniform Plumbing Code requires using a model that does not drain into the ground. Yard hydrants that conform to American Society of Sanitary Engineers Standard 1057 are acceptable because they do not drain into the ground.</p> <p>Even though a yard hydrant conforming to Standard 1057 is allowed, the water system should make every possible effort to install a sample tap directly off the well pump discharge pipe within a controlled environment (for example, inside a secured well house).</p>

Item 28, 28a, and 28b	<p>Is the source metered?</p> <p>If yes, is the source meter read at least monthly?</p> <p>If yes, are the water production records maintained?</p>
Guidance	Source meter installation and source meter reading became regulatory requirements in 2007. A reliable meter read on a regular basis will inform the operator and system owner about the water they supply to the distribution system. For example, unexplained changes in measured well output is a reason for investigation. A new leak or unauthorized use will show up as an unexplained increase in well production. Declining aquifer levels, well failure or pump mechanical problems will show up as an unexplained decrease in pumping flow rate. Operators need this information as soon as possible.
How to mark the checklist	<p>Mark as “Yes” if a source meter is installed and measuring total production from the source.</p> <p>Mark “Yes” if the operator reads the source meter at least once a month.</p> <p>Mark “Yes” if your record review confirms that the operator recorded monthly source meter readings at least once a month for the past 12 months.</p>
Classification	Observation if any part of this question is marked “No.”
WAC reference	<p>WAC 246-290-130</p> <p>WAC 246-290-496</p>
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p> <p><i>Completing Your Annual WUE Report: Answers to commonly asked questions</i> (331-459) http://www.doh.wa.gov/portals/1/Documents/pubs/331-459.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/WaterUseEfficiency.aspx
Standard language	<p>If no source meter</p> <p>A water system must install a meter on each of its public water supply sources and record water production at least monthly (WAC 246-290-496). Currently, there is no source meter on Well X (S0X). Delivering a public water supply without a source meter, and without the valuable information a meter provides, can be detrimental to system operation. We recommend that you record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns.</p> <p>If source meter is not read monthly or is not recorded</p> <p>A water system must measure and record water production for each of its sources at least monthly (WAC 246-290-496). We recommend that you record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns.</p>
Other notes for the sanitary surveyor	A source meter, information on how much water is consumed (service meter readings), and estimates of authorized but un-metered uses, will allow the operator to calculate distribution system leakage.

Item 29	Is the well house properly constructed and maintained?
Guidance	It is safe to enter most well houses. However, if you consider a well house structure unstable or in such disrepair that entry is unsafe, DO NOT enter the structure. Record on the checklist and photograph the condition of the structure. DOH will follow-up with the purveyor to ensure the structure is safe, or restored to a safe condition.
How to mark the checklist	Mark as “Yes” if the well house was constructed of durable materials, is weatherproof, has a source of heat (if in a freezing climate), and is free of obvious electrical or mechanical hazards.
Classification	Recommendation if marked “No.” (If the well house condition is so bad that it is unsafe to enter, don’t enter. Identify the problem as a significant finding in the comments section.)
WAC reference	WAC 246-290-415(1) & (3) & (8) WAC 246-290-135(2)(a)
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	We recommend that you improve the structural integrity of the well house. The structural integrity of the well house is important. It protects and maintains electrical and mechanical equipment essential to the proper functioning of your water system. (Then list the specific improvements you believe they should make.)
Other notes for the sanitary surveyor	<p>Record observations if there is a risk of freezing (no reliable heat source; insufficient insulation); leaking roof; leaking pipes; standing water; obvious physical or electrical hazards (confined space, unsafe wiring); or severe corrosion.</p> <p>If the well house condition compromises security and leaves the structure vulnerable to unauthorized entry, address this through Item 31.</p> <p>Inadequately protected well houses or enclosures may harbor animal or insect infestations. The SCA includes the immediate area around the well (refer to Item 19 and Item 30). Rodent, bat, bird and insect nests in a well house are all potential sources of contamination.</p> <p>Poor ventilation, leaking roofs or vapors from chlorine disinfection equipment may cause extreme corrosion of pipes, valves, pressure tanks and controls. Proper maintenance should protect the source facilities against corrosion.</p>

Item 30	Is there evidence of rodent infestation?
Guidance	Avoid contact with rodent feces or urine. If the space appears badly infested, DO NOT ENTER. DOH will follow-up with the operator or owner to ensure they make the structure safe to enter. If you observe any rodent droppings, mark it on the checklist and photograph the evidence of infestation, and any obvious pathway for mice to enter the well house or well enclosure.
How to mark the checklist	Mark as “No” if you do not observe any sign of mice or other rodent infestation.
Classification	Recommendation if marked “Yes.” (If the rodent contamination is so bad that it is unsafe to enter, don’t enter. Identify the problem as a significant finding in the comments section.)
WAC reference	
Publications	<i>Pest Control</i> (331-363) http://www.doh.wa.gov/portals/1/Documents/pubs/331-363.pdf
Webpage(s)	
Standard language	We recommend that you take the steps necessary to keep rodents out of your facilities. Rodents can carry disease and may create an unsafe working environment. Furthermore, if an opening into the well develops, they could contaminant the drinking water system. Finally, consider what your customers would think of their water system if they saw evidence of rodent infestation in an environment they expect you to maintain to the highest standards.
Other notes for the sanitary surveyor	Inform the operator that DOH believes the condition of the well house reflects the care given to other water system facilities, even those you can’t or won’t see during the survey. We will refer any operator who believes rodent infestation at a public drinking water supply enclosure is tolerable to the DOH Operator Certification Program.

Item 31	Is the well house protected adequately from unauthorized access?
Guidance	The well house should be constructed of rigid walls (tarps covering decayed or damaged walls are unacceptable). The water system should make sure the door(s) and window(s) are locked or otherwise secured against unauthorized entry. There may be other acceptable ways to secure the well house. For example, a perimeter fence with a locking gate may replace the need to lock the well house.
How to mark the checklist	Mark as “Yes” if you believe the well house is adequately protected from unauthorized entry
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-415 (5) WAC 246-290-415 (8)
Publications	<i>Responding to a threat against a water system</i> (331-183) http://www.doh.wa.gov/portals/1/Documents/pubs/331-183.pdf <i>Water System Security and Emergency Response Planning</i> (331-199) http://www.doh.wa.gov/portals/1/Documents/pubs/331-199.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyResponseandSecurity.aspx
Standard language	<p>If the issue is simply ensuring doors and windows are locked</p> <p>You must secure the well house against unauthorized entry. Install locks and lock all entries to the well house. Keep windows locked or otherwise prevent unauthorized entry.</p> <p>If the issue of well house security is more complex</p> <p>The interior of the well house is vulnerable to vandalism and unauthorized entry due to _____. You must submit a plan to DOH to secure the well house against unauthorized entry.</p>
Other notes for the sanitary surveyor	

Item 32	Is there a pump control valve or vacuum relief valve without an air gap on the valve discharge pipe?
Guidance	<p>This item applies to wells with line-shaft turbine pumps. There must be at least a 2-pipe diameter air gap on the pump-control valve discharge. Whenever the turbine pump shuts off, the water in the pump column falls back down into the well and, in doing so, pulls air in through the fully open pump-control valve. The air gap will prevent the resulting vacuum from contaminating the well or well discharge piping. If a pump-control valve discharge-pipe ends outside the pump house, steel mesh must securely cover the open end of the pipe to prevent tampering with the drinking water supply.</p> <p>This same concern applies to any air vacuum relief valve installed on a turbine pump discharge piping system. Make sure there is a screen secured at the end of the air vacuum valve discharge.</p> <p>Wells equipped with large submersible pumps may have a pump control valve to control water hammer. An air gap is needed on the pump-control valve discharge in case the submersible pump check valve fails.</p>
How to mark the checklist	Mark as “Yes” if there isn’t at least a 2-pipe-diameter air gap on a pump control valve or vacuum relief valve discharge.
Classification	Significant deficiency if marked “Yes.”
WAC reference	WAC 246-290-415 (5) WAC 246-290-490
Publications	
Webpage(s)	
Standard language	Install an air gap on the pump control valve discharge line (or vacuum relief valve), and secure a non-corrodible ¼-inch mesh screen over the end of the discharge line.
Other notes for the sanitary surveyor	<p>The pump control valve is on a branch line of the main well discharge to the distribution system. The branch line comes off the main line between the wellhead and the main line check valve. The pump control valve remains wide open while the turbine pump is off. When the pump turns on, it discharges air through the pump control valve, followed by a strong flow of water.</p> <p>The air discharged when the pump starts up is from the part of the pump discharge column drained of water when the well pump shut down (the pump discharge column is the pipe connected to the well pump inside the well casing). After the well pump starts, the pump control valve begins to slowly close, allowing water to continue flowing through the pump control valve. As the valve slowly closes, water is introduced into the system in a measured way through the mainline check valve, thus preventing “water hammer.” The pump control valve may take up to a few minutes to completely close</p> <p>When the well pump controller signals the turbine pump to stop, the pump continues to operate but the pump control valve begins to open slowly. This creates a measured decline in flow through the mainline check valve that prevents “water hammer” from too rapid a shutdown. When the pump control valve finally opens up fully (or near fully), the well pump shuts down. When the well pump shuts down, the water in the discharge pipe between the mainline check valve and the well falls back into the well. The air drawn into the open pump control valve relieves the vacuum. If the end of the pump control valve is submerged, it may suck that material back into the drinking water supply.</p>

Item 33	Are the source pump and pump controls operational and adequate to prevent chronic water outages or premature pump failure?
Guidance	If the source pump fails, and there is no other pump or atmospheric storage, the system will quickly depressurize. We are interested in identifying threats that could cause the water system to lose pressure. See examples below.
How to mark the checklist	<p>Mark as “Yes” if you believe the pump and pump control system(s) construction, and its current operation and maintenance will prevent chronic water outages or premature pump failure.</p> <p>Mark as “No” if you find significant defects in the construction, maintenance or operation of pump and pump controls that present a high risk of equipment failure or failure to maintain pressure in the distribution system.</p> <p>If you mark as “No,” describe in the comments section of Part D in the checklist.</p>
Classification	Significant deficiency is marked “No.”
WAC reference	WAC 246-290-415 (5)
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p> <p><i>Pump Controls</i> (331-401) http://www.doh.wa.gov/portals/1/Documents/pubs/331-401.pdf</p>
Webpage(s)	
Standard language	The _____ (describe the problem(s)) pose(s) an unreasonable risk to the reliability of the drinking water supply. Submit to DOH your plan to address this problem.

Other notes for the sanitary surveyor	<p>Examples of circumstances that can lead to premature pump failure include:</p> <ol style="list-style-type: none"> 1. A pump cycling on/off too frequently is a pump with a short motor life. The build-up of heat generated at motor start-up causes motor failure. If the time between start-ups is too short to allow this heat to dissipate, the electric motor will eventually overheat. We suggest no more than six starts per hour unless the operator or owner can prove the pump motor manufacturer claims a greater start-per-hour allowance. 2. Recycling pump discharge through a PRV back to the suction side of the pump at a very low flow rate for extended periods will heat the water. This causes increased risk of cavitation, which threatens pump failure. Operating at a low flow rate will likely mean the pump is operating near its shutoff head (unless it's equipped with a variable frequency drive). This causes imbalances of forces on thrust bearings, which can cause premature failure of the pump. 3. Rapid change from low to high flow rate or vice versa (immediate start-up and immediate shutdown) can cause a telltale water hammer. Transient pressure waves that cause banging pipes and equipment can blow fittings and pump casings. 4. Net positive suction head (NPSH) is the head on the suction side of the pump. Pumps require NPSH to function. If the reservoir level or distribution system pressure that the pump pulls from drops too low, the pump will continue to operate but little or nothing will be pumped. Cavitation may occur, leading to pump failure. 5. Wells that experience significant drawdown or seasonal decline in aquifer level are a potential risk to the well pump. Without a well level sensing device to shut the well pump off, drawdown to the well pump will cause air to enter the pump, causing cavitation. <p>Examples of pump controls that can lead to depressurization of part or all of the water system:</p> <ol style="list-style-type: none"> 1. The setting for pump-on and pump-off is such that pressure within certain parts of the distribution system experience very low pressure. 2. The pump control valve isn't working properly, which keeps the pump from coming on or shutting off. Well pump control valves often have limit switches, which measure the open or closed position of the valve. If the limit switch isn't set correctly, it can cause the pump to operate outside its intended logic control. <p>Read our guidance on Pump Controls¹³ (331-401)</p> <p>See Item 65 on pressure tanks. If the condition of one or more pressure tanks poses a risk of failure of the pumping system, note this in the comments section of Parts G and H.</p>
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¹³ <http://www.doh.wa.gov/portals/1/Documents/pubs/331-401.pdf>

Item 34	Is the spring box (structure, hatch, and overflow) constructed to prevent the entry of contaminants or direct surface drainage?
Guidance	<p>Look for surface drainage pathways into the spring box.</p> <p>The construction of a spring box hatch (if any) should be similar to a hatch on a storage tank (see Item 73). The same methods required to secure the reservoir roof, vents, and overflows should be used to protect the spring box roof, overflow and vent (if any). See Items 72 through 76. The structure should be secure against shallow seepage of surface water (cracked structure, poor fitting pipe passage through structure wall, and so on).</p>
How to mark the checklist	Mark as “Yes” if the spring box structure prevents entry of animals, surface drainage or any other contaminant.
Classification	Significant deficiency if marked “No.”
WAC reference	<p>WAC 246-290-130, -135</p> <p>WAC 246-290-235</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Sanitary Protection of Reservoirs: Hatches</i> (331-249) http://www.doh.wa.gov/portals/1/Documents/pubs/331-249.pdf</p> <p><i>Sanitary Protection of Reservoirs: Vents</i> (331-250) http://www.doh.wa.gov/portals/1/Documents/pubs/331-250.pdf</p>
Webpage(s)	
Standard language	<p>The surveyor may elaborate on specific measures the system should take, such as modifying the overflow, vent, hatch, or the entire structure:</p> <p>You must protect the end of the overflow pipe with 24-mesh non-corrodible screen or cover it with a flapper valve to prevent entry of birds, rodents or insects. See the appropriate standards for ways to reduce the risk of contamination via the overflow in <i>Sanitary Protection of Reservoirs: Vents</i> (331-250).</p> <p>You must modify the access hatch so that the sides overlap a raised curb with gasket on the tank, and lock the hatch cover. The appropriate standard for a storage tank access hatch is in <i>Sanitary Protection of Reservoirs: Hatches</i> (331-249).</p> <p>You must modify the spring box vent so that it does not permit contaminants to enter the public drinking water supply. See the appropriate standards for finished water storage tank vents in <i>Sanitary Protection of Reservoirs: Vents</i> (331-250).</p> <p>The construction of the spring box does not provide sufficient protection from entry of surface water or shallow groundwater. Modify the spring box structure for source S0X to make it watertight, so it keeps out surface water. Re-grade the surrounding area if surface runoff, or standing water next to the spring box, poses a risk of submerging the spring box. Submit electronic photographs when you complete the improvements.</p>
Other notes for the sanitary surveyor	<p>The presence of a chlorinator, even with ample contact time before the first customer, is not a substitute for securing the spring box from contaminants.</p> <p>The sanitary survey concerns at a spring box may be very similar to those described for a wellhead or finished water storage tank. We want to be sure that the spring box is not at risk of submergence, or surface water infiltration (similar to concerns expressed at a well). We also want to be sure that any spring box appurtenances, such as a hatchway, overflow or vent, do not permit contaminants to enter the water supply (similar to concerns expressed at a finished water storage tank).</p>

Item 35	Is there a raw-water source sample tap?
Guidance	See Item 27.
How to mark the checklist	Mark as “Yes” if there is a raw water sample tap.
Classification	Significant finding if marked “No.”
WAC reference	See Item 27.
Publications	See Item 27.
Webpage(s)	See Item 27.
Standard language	Install a water-sampling tap downstream of S0___ and before any form or treatment. You must be able to collect a raw water sample prior to entry to the distribution system to comply with the triggered source monitoring and the assessment source monitoring provisions of the Groundwater Rule.
Other notes for the sanitary surveyor	See Item 27.

Item 36, 36a, and 36b	<p>Is the source metered?</p> <p>If yes, is the source meter read at least monthly?</p> <p>If yes, are the water production records maintained?</p>
Guidance	Source meter installation and source meter reading became regulatory requirements in 2007. A reliable meter read on a regular basis will inform the operator and system owner about the water they supply to customers. For example, an unexplained change in measured source output is a reason for investigation. A new leak or unauthorized use will show up as an unexplained increase in well production. Declining aquifer levels, well failure or pump mechanical problems will show up as an unexplained decrease in pumping flow rate. Operators need this information as soon as possible.
How to mark the checklist	<p>Mark Item 36 “Yes” if a source meter is installed and measuring total production from the source.</p> <p>Mark Item 36a “Yes” if the operator reads the source meter at least once a month.</p> <p>Mark Item 36b “Yes” if your record review confirms that the operator recorded monthly source meter readings at least once a month for the past 12 months.</p>
Classification	Observation if any part of this question is marked “No.”
WAC reference	<p>WAC 246-290-130</p> <p>WAC 246-290-496</p>
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p> <p><i>Completing Your Annual WUE Report: Answers to commonly asked questions</i> (331-459) http://www.doh.wa.gov/portals/1/Documents/pubs/331-459.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/WaterUseEfficiency.aspx
Standard language	<p>If no source meter</p> <p>A water system must install a meter on each of its public water supply sources and record water production at least monthly (WAC 246-290-496). Currently, there is no source meter on the spring (S0#). Operating a public water supply without a source meter, and without the valuable information a meter provides, can be detrimental to system operation. We recommend that you record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns.</p> <p>If source meter is not read monthly or is not recorded</p> <p>A water system must measure and record water production for each of its sources at least monthly (WAC 246-290-496). We recommend that you record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns.</p>
Other notes for the sanitary surveyor	A source meter, information on how much water is consumed (service meter readings), and estimates of authorized but un-metered uses will allow the operator to calculate distribution system leakage.

Item 37	Is the spring house properly constructed and maintained?
Guidance	See Item 29.
How to mark the checklist	See Item 29.
Classification	Recommendation if marked “No.” (If the spring house condition is so bad that it is unsafe to enter, don’t enter. Identify the problem as a significant finding in the comments section.)
WAC reference	See Item 29.
Publications	See Item 29.
Webpage(s)	See Item 29.
Standard language	We recommend that you improve the structural integrity of the spring house. The structural integrity of the spring house is important. It protects and maintains electrical and mechanical equipment essential to the proper functioning of your water system.
Other notes for the sanitary surveyor	<p>Record observations if there is a risk of freezing (no reliable heat source; insufficient insulation); leaking roof; leaking pipes; standing water; obvious physical or electrical hazards (confined space, unsafe wiring); or severe corrosion.</p> <p>If the spring house condition compromises security and leaves the structure vulnerable to unauthorized entry, address this through Item 39.</p>

Item 38	Is there evidence of rodent infestation?
Guidance	Avoid contact with mice feces or urine. If the space appears badly infested, DO NOT ENTER. DOH will follow-up with the operator or owner to ensure they make the structure safe to enter. If you observe any rodent droppings, mark it on the checklist and photograph the evidence of infestation, and any obvious pathway for mice to enter the spring house.
How to mark the checklist	Mark as “No” if you do not observe any sign of mice or other rodent infestation.
Classification	Recommendation if marked “Yes” (If the rodent infestation is so bad that it is unsafe to enter, don’t enter. Identify the problem as a significant finding in the comments section.)
WAC reference	
Publications	<i>Pest Control</i> (331-363) http://www.doh.wa.gov/portals/1/Documents/pubs/331-363.pdf
Webpage(s)	
Standard language	We recommend that you take the steps necessary to keep rodents out of your facilities. Rodents could carry disease and may create an unsafe working environment. Furthermore, if an opening into the spring develops, they could contaminate the drinking water system. Finally, consider what your customers would think of their water system if they saw evidence of rodent infestation in an environment they expect you to maintain to the highest standards.
Other notes for the sanitary surveyor	Inform the operator that DOH believes the condition of the spring house reflects the care given to other water system facilities, even those you can’t or won’t see during the survey. We will refer any operator who believes rodent infestation in a public drinking water supply enclosure is tolerable to the DOH Operator Certification Program.

Item 39	Are the spring house and spring box adequately protected from unauthorized access?
Guidance	See Item 31.
How to mark the checklist	See Item 31.
Classification	Significant finding if marked “No.”
WAC reference	See Item 31.
Publications	See Item 31.
Webpage(s)	See Item 31.
Standard language	<p>If the issue is simply ensuring doors and windows are locked:</p> <p>You must secure the spring house against unauthorized entry. Install locks and lock all entries to the spring house. Keep windows locked or otherwise prevent unauthorized entry.</p> <p>If the issue of spring house security is more complex:</p> <p>The interior of the spring house is vulnerable to vandalism and unauthorized entry due to _____. You must submit a plan to DOH to secure the spring house against unauthorized entry.</p> <p>If security with the spring box is an issue:</p> <p>You must lock the access hatch cover. The appropriate standard for a storage-tank access hatch is in <i>Sanitary Protection of Reservoirs: Hatches</i> (331-249).</p>
Other notes for the sanitary surveyor	The construction and maintenance of the spring box and spring house should deter unauthorized entry or vandalism. For example, it should keep a person from intentionally inserting material into the spring collection box. DOH expects the operator or owner to lock each spring box hatch or bolt it in place with bolts requiring a special tool to remove.

Item 40	Is the Sanitary Control Area (SCA) free of unmitigated potential sources of contamination?
Guidance	<p>If the surveyor observes a potential contaminant threat in the sanitary control area (SCA), it's important to determine whether the threat has already been evaluated.</p> <p>Therefore, before the survey, review the previous sanitary survey cover letter and checklist to determine whether the last surveyor identified any potential source of contamination in the SCA. If so, during the current survey, find out whether the purveyor removed the contamination source, developed a DOH-approved mitigation plan, or got DOH approval to reduce the SCA (WAC 246-290-135).</p> <p>Potential threats include a sanitary sewer, septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, roadway drainage swale, nearby surface water, fuel or chemical storage, or fuel pipelines within the SCA.</p> <p>If you observe that the water system failed to take the steps required in the last survey, or currently fails to maintain mitigation, the failure is a SIGNIFICANT DEFICIENCY. In addition, any new (previously unrecorded) potential contaminant threat is a SIGNIFICANT DEFICIENCY.</p>
How to mark the checklist	<p>Mark as "Yes" if there are no potential sources of contaminant within 200 feet of the spring.</p> <p>Mark as "Yes" if there are potential sources of contamination, but you are certain that the purveyor appropriately mitigated the threat or DOH has approved a reduction in the SCA.</p> <p>Mark as "No" for all other circumstances. All "No" answers will trigger a DOH file review before completing the cover letter. The review will determine whether there is any history of a mitigation plan approval (including the need for treatment), or a past approval of a reduction in the SCA</p>
Classification	Potential significant deficiency if marked "No," subject to file research and DOH confirmation before completing of the cover letter.
WAC reference	<p>WAC 246-290-135</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Source Water Protection Requirements</i> (331-106) http://www.doh.wa.gov/portals/1/Documents/pubs/331-106.pdf</p> <p><i>Wellhead Protection Program Guidance Document</i> (331-018) http://www.doh.wa.gov/portals/1/Documents/pubs/331-018.pdf</p> <p><i>Sanitary Control Area Protection</i> (331-453) http://www.doh.wa.gov/portals/1/Documents/pubs/331-453.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/sourcewater/SourceWaterProtection.aspx
Standard language	<p>For a biological contaminant hazard that cannot be removed easily (sewer line, septic tank, drain field, irrigation canal or other surface water, waste lagoon, manure pile)</p> <p>[Name the biological hazard(s)] is/are present in the sanitary control area of Spring <u> X </u> (S0<u> X </u>). Please submit a scaled map showing all buildings and potential sources of contamination located within 200 feet of the spring. Include all known information about the type, size, depth, and other construction details of the potential contaminant source. Also, include a copy of the construction details for the spring. Based on the information submitted, DOH will contact you about further follow-up actions that may be required.</p> <p>For a biological contaminant hazard that can be moved or removed (portable toilet,</p>

	<p>manure pile)</p> <p>Remove the (name the item here) to a distance greater than 200 feet from Spring <u>X</u>.</p> <p>For a chemical contaminant hazard that cannot be easily moved or removed (buried fuel tank or fuel lines, above ground bulk fuel or chemical storage)</p> <p>Please submit a scaled map showing all buildings and potential contamination sources located within 200 feet of the spring. Include all known information about the type, size, depth and other construction details of the potential contaminant source, including any mitigating design features such as existing spill containment, double-wall construction, and so on. Also, include a copy of the construction details for the spring. Based on the information submitted, DOH will contact you about further follow-up actions that may be required.</p> <p>For a chemical contaminant hazard that can be moved or removed (household chemicals, fuel cans, pesticides)</p> <p>Remove the [name the chemical hazard(s) here] to a distance greater than 200 feet from Spring <u>X</u>.</p>
Other notes for the sanitary surveyor	<p>Not all potential sources of contamination have the same priority. Moreover, many potential contaminant threats are not significant deficiencies.</p> <p>To illustrate this point, we begin with the most serious threats to health: microbiological contaminants. A surveyor should identify sanitary sewers (especially old clay or concrete sewer lines), septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, roadway drainage swale, or surface water within 200 feet of a spring as significant deficiencies.</p> <p>Find out whether the purveyor has DOH approval to mitigate or reduce such threats in the SCA. If not, we will require the purveyor to eliminate these contaminant sources from the SCA, or to demonstrate that it mitigated the threat appropriately. Treatment to 4-log virus inactivation of the source is also an option for addressing SCA violations (WAC 246-290-451).</p> <p>At the other end of the spectrum is an occasional application of glyphosate (Round-up) for weed control or a parked car, which may leak motor oil or other engine fluids. These are chronic contaminants that source chemical sampling would detect, and don't pose an immediate risk to health. If the scale of the potential threat is small, you should mark this checklist item as "Yes," but add comments about what you observed and why you believe it possess no real risk to the safety of the water supply.</p>

Checklist Part E: Disinfection

This section of the checklist is devoted to disinfection of drinking water supplies using chlorine or UV light. Most purveyors use disinfection treatment at the source, so they can link the treatment dosage closely to the rate of flow from the well and ensure treatment of all the water entering the system.

Chlorine is a very common disinfectant in drinking water. Purveyors also may use chlorine to support other treatment objectives, such as removing iron and manganese or reducing taste and odor problems.

In Washington, more than 1,000 small water systems add chlorine to one or more drinking water sources. A much smaller number of systems use UV disinfection.

There are three groundwater disinfection treatment objectives:

1. Appropriate source treatment for each groundwater source with *E. coli* detected in the source water. These are Groundwater Rule (GWR) 4-log virus treatment circumstances.
2. Appropriate source treatment for each groundwater source with known total coliform contamination, with characteristics reflecting a heightened level of risk to microbial contamination, or using seawater RO sources. These are state-mandated 4-log virus treatment circumstances.
3. Appropriate source treatment needed to provide a measureable chemical (usually free chlorine) residual in the distribution system at all times. A repeated violation of the total coliform MCL usually drives this requirement. These are **distribution system residual** treatment circumstances.

Typically, purveyors satisfy the 4-log virus treatment requirement by achieving CT6 disinfection through chlorination prior to the first customer. No small system uses UV to satisfy this requirement.

“CT6” is an abbreviation for free chlorine *Concentration* (mg/l) times *Time* (minutes). The concentration is the measure of free chlorine at the end of the contact time. The time is the number of minutes the water is in contact with free chlorine before the first customer, calculated during peak flow. To achieve 4-log (99.99%) virus inactivation, C x T must be equal to or greater than 6.

Our highest priority for groundwater disinfection is to be sure sources with a CT6 treatment requirement are operated consistent with effective and reliable treatment.

Topics to describe in the comments section of Part E:

Describe the chlorination facilities, including purpose for chlorination, concerns with maintenance or operations, purveyor’s recordkeeping of monthly reports, and sanitary and security observations:

Item 41	Does the operator batch chlorinate the source, the distribution system or the reservoir just before collecting routine or repeat coliform samples?
Guidance	<p>“Batch” or “shock” chlorination is dumping a slug of chlorine into the water system. This is an appropriate practice after an event threatens water quality. However, it is not an acceptable routine practice if it interferes with collecting representative coliform samples from the distribution system.</p> <p>Operators may not add chlorine before collecting routine coliform samples because doing so creates an unrepresentative condition in the distribution system. It’s cheating. Likewise, dumping chlorine into the water system right after an unsatisfactory coliform sample, and before repeat coliform samples are collected, violates WAC 246-290-320 (2).</p>
How to mark the checklist	Mark as “Yes” or “No,” based on the operator’s response to the question.
Classification	If marked “Yes,” a referral will be made to the DOH Operator Certification Program for follow-up.
WAC reference	<p>WAC 246-290-300 (3)</p> <p>WAC 246-290-320 (2)</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Follow-up to an Unsatisfactory Coliform Sample</i> (331-187)</p> <p>http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-187.pdf</p>
Webpage(s)	
Standard language	DOH may contact you to inquire further into your practice of batch chlorinating the system just prior to collecting your routine and repeat coliform samples.
Other notes for the sanitary surveyor	If the operator practices batch chlorination, attempt to determine whether it’s an innocent misunderstanding of the regulation, or an intentional circumvention. If it’s the latter, make a note of it in Part L of the checklist.

Item 42	Did you observe disinfection treatment connected to the water system in active use that is NOT listed on the WFI?
Guidance	A purveyor must accurately list all forms of treatment it uses on its Water Facilities Inventory (WFI). Disinfection treatment has implications for the purveyor's coliform and disinfection byproducts monitoring and reporting requirements.
How to mark the checklist	Mark 42 as "Yes" if you observe an operational disinfection process that's not listed on the WFI (see WFI box 21).
Classification	Observation if marked "Yes."
WAC reference	WAC 246-290-110, 120 WAC 246-290-415 (5)
Publications	
Webpage(s)	
Standard language	Purveyors must obtain written DOH approval before constructing water system improvements, such as disinfection facilities (WAC 246-290-120 (2)). Submit to DOH as-built design information for the disinfection treatment process.
Other notes for the sanitary surveyor	Surveyors should check with DOH about the purveyor's disinfection treatment approval status before completing the sanitary survey cover letter and checklist.

Item 43	Is ultraviolet light (UV) used to disinfect a drinking water source?
Guidance	<p>UV disinfection of groundwater supplies for small water systems usually results when the owner wants to address a source contamination problem while trying to avoid adding chlorine. Many of the UV systems you will encounter are not DOH-approved.</p> <p>The typical small UV unit is effective at inactivating bacteria, but less so at inactivating viruses. Because water systems sample only for coliform bacteria and not for viruses, they view the use of UV as successful treatment. DO NOT assume that 1) DOH approved the in-place UV treatment or 2) that UV is suitable mitigation for the microbiological threat within the SCA.</p>
How to mark the checklist	Mark as “Yes” if a source is treated with UV disinfection.
Classification	Recommendation
WAC reference	
Publications	<p><i>Alternate Disinfectants</i> (331-252) http://www.doh.wa.gov/portals/1/Documents/pubs/331-252.pdf</p> <p><i>Water System Design Manual</i> (331-123) http://www.doh.wa.gov/portals/1/Documents/pubs/331-123.pdf (Table 12-4 and Appendix I)</p>
Webpage(s)	
Standard language	<p>Your existing UV unit may provide a sufficient dose to kill coliform bacteria. However, viruses may be present in sources contaminated with coliform bacteria. DOH recommends that UV installations provide a UV dose of at least 186 mJ/cm² in order to ensure destruction of viruses that may be present in a contaminated source. The unit I inspected provides only about 20 percent of the recommended dose, and is insufficient to destroy viruses that may be present in your source water.</p> <p>We recommend you contact DOH to discuss alternatives to your current UV treatment.</p>
Other notes for the sanitary surveyor	<p>Small water systems supplied by groundwater may operate UV disinfection on one or more sources, but it’s very unlikely that DOH approved the UV unit to provide 4-log virus inactivation (a Groundwater Rule requirement triggered by <i>E. Coli</i> detected in source water). Small systems usually install UV because they want to avoid installing chlorine disinfection after past repeated coliform violations.</p> <p>Presently, DOH rarely approves UV treatment of a contaminated groundwater supply. This is because the approval process and criteria is very complex compared to the requirements needed to achieve 4-log virus inactivation with chlorine. See Appendix I in the <i>Water System Design Manual</i> (331-123). DOH will not approve UV in response to repeated total coliform violations in the distribution system because UV carries no residual into the distribution system.</p>

Item 44	Is the UV unit sized for the maximum flow rate, and is there a UV transmittance sensor controlling a solenoid valve or other device to shut off supply if the UV light fails?
Guidance	<p>The effectiveness of UV disinfection relies entirely on irradiating the water as it passes by the UV light. Improper flow rate, dirty glass (“quartz”) sleeve, or a burned-out light all interfere with the rated UV dose the unit applies to the water.</p> <p>Excessive flow rate will reduce the time the water is in contact with UV radiation.</p> <p>A dirty quartz sleeve around the UV light will interfere with the passage of UV radiation to the water.</p> <p>A burned out UV light will impart no UV dose to the water.</p> <p>Check the flow rate into the UV unit. Is it equal to or less than the rated capacity of the unit?</p> <p>Check for a sensing device that reads the level of UV radiation transmitted across the diameter of the UV unit. Does the sensor connect with a solenoid valve that will shut the water off if the sensor detects insufficient or no UV dose to the water? (dirty quartz sleeve or burned out UV light).</p> <p>Ask how often the UV light is replaced. It should be replaced every 12 months.</p>
How to mark the checklist	Mark as “Yes” if there is 1) a flow control device that prevents flow into the unit from exceeding its rated capacity and 2) a UV transmittance sensor tied to a solenoid valve.
Classification	Recommendation if marked “No.”
WAC reference	
Publications	
Webpage(s)	
Standard language	<p>Use one or more of the following statements, as applicable:</p> <p>We recommend that you install a flow control device so that the flow through the UV unit doesn’t exceed the rated capacity of the unit.</p> <p>We recommend that you install a UV transmittance sensor and solenoid valve so that the device will stop flow through the unit if the UV light fails.</p> <p>We recommend that you replace the UV light every 12 months.</p>
Other notes for the sanitary surveyor	<p>If the purveyor operates the UV unit beyond its rated capacity (gpm), the water will move through the UV unit too fast and the radiation dose will be reduced. If the purveyor cannot identify the rated capacity of the unit, it’s impossible to know whether the flow through the unit is within the unit’s rated treatment capacity. A flow control valve allowing flow equal to or less than the UV unit’s rated flow capacity will ensure an appropriate flow rate through the UV unit.</p> <p>Find out whether the operator cleans the quartz sleeve at least once a month (look for a squeegee device that allows cleaning while the unit is in service). This is especially important if there is no UV transmittance sensor to identify when the unit is not applying a sufficient radiation dose to the water.</p> <p>Ask the purveyor how often the manufacturer recommends replacing the UV light. The purveyor should not wait until the UV light burns out to replace it.</p>

Item 45	Describe the UV equipment
Guidance	Record the manufacturer, model number, rated capacity (gpm), and recommended frequency for cleaning the quartz sleeve and replacing the UV light.
How to mark the checklist	Complete the checklist based on best available information provided during the survey.
Classification	Informational
WAC reference	
Publications	
Webpage(s)	
Standard language	None
Other notes for the sanitary surveyor	

Item 46 and 46a	<p>Is there continuous chlorination?</p> <p>If yes, please measure the free chlorine residual from a representative location in the distribution system.</p>
Guidance	<p>There are three reasons for a purveyor to provide continuous chlorination to one or more source:</p> <ol style="list-style-type: none"> 1. To maintain a free chlorine residual in the distribution system and maintain water quality in the distribution system. 2. To provide 4-log virus treatment of a source before it enters the distribution system (99.99% inactivation). This is called “CT6” treatment (see Item 51). 3. To support the primary goal of treatment (proper removal of iron, manganese or arsenic may require an oxidant like chlorine).
How to mark the checklist	Mark Item 46 “Yes” if the purveyor operates a chlorine injection system to treat one or more source. Note the reason for continuous chlorination in the comments section of Part E.
Classification	Informational
WAC reference	<p>WAC 246-290-300 (6)</p> <p>WAC 246-290-451</p>
Publications	<p><i>How to Handle Chlorine Gas Safely</i> (331-364) http://www.doh.wa.gov/portals/1/Documents/pubs/331-364.pdf</p> <p><i>Chlorination Controls</i> (331-398) http://www.doh.wa.gov/portals/1/Documents/pubs/331-398.pdf</p> <p><i>Measuring Free Chlorine</i> (331-442) http://www.doh.wa.gov/portals/1/Documents/pubs/331-442.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/SystemDesign/ChlorinationofDrinkingWater.aspx
Standard language	None
Other notes for the sanitary surveyor	<p>You should use your own chlorine residual field test kit to measure the free chlorine residual in the distribution system. Then ask the operator to measure free chlorine at the same location(s), so you can compare and record both results.</p> <p>Do not measure for total chlorine. Total chlorine includes free chlorine plus combined chlorine. Free chlorine is the chlorine residual that can effectively disinfect against microorganisms. Combined chlorine is a weak and relatively ineffective substitute for free chlorine.</p> <p>Check the operator’s chlorine test kit: the reagent expiration date, and the reagent sample size in relation to the volume of water the operator added to the reagent. Reagent “pillows” are designed for a specific sample volume (5 ml, 10 ml and so on).</p>

Item 47	Is there a water supply line plumbed directly into a chlorine solution tank without a reduced pressure backflow assembly on the supply line?
Guidance	This is a high-risk cross connection. There should be an air gap or reduced pressure backflow assembly between the supply line and the chlorine solution tank. Without the appropriate backflow protection, a negative pressure event could siphon the content of the chemical solution tank into the supply line creating a real health hazard.
How to mark the checklist	<p>Mark as “No” if there is no chemical solution tank.</p> <p>Mark as “No” if there is a chemical solution tank but there is no potable water supply pipe hard-plumbed into the solution tank.</p> <p>Mark as “No” if there is a chemical solution tank, there is a potable water supply pipe hard-plumbed into the solution tank, and there is a reduced pressure backflow assembly on the potable water supply pipe to the solution tank.</p>
Classification	Significant deficiency if marked “Yes.”
WAC reference	<p>WAC 246-290-415 (5)</p> <p>WAC 246-290-490</p>
Publications	
Webpage(s)	
Standard language	The cross connection with the chemical solution tank represents a high risk for contamination of the drinking water supply. Install an air gap or reduced pressure backflow assembly on the water supply line to the tank.
Other notes for the sanitary surveyor	Take a picture of the reduced pressure backflow assembly (if applicable).

Item 48	Is there a post-treatment sample tap?
Guidance	Operators must take all source samples for analytes, such as VOCs, IOCs, radionuclides and SOC, at the source prior to entry into the distribution system and after treatment. This post-treatment sampling will detect changes in the analytes that occur as a result treatment (addition of a chemical or physical change).
How to mark the checklist	Mark as “Yes” if there is a post-treatment sample tap located prior to entry to the distribution system.
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-300 WAC 246-290-415 (5)
Publications	<i>Inorganic Chemical (IOC) Sampling Procedure</i> (331-221) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-221.pdf
Webpage(s)	
Standard language	Install a water-sampling tap after all forms of water treatment at S0_. You must be able to collect a post-treatment water sample prior to entry to the distribution system to comply with routine source monitoring requirements in chapter 246-290 WAC.
Other notes for the sanitary surveyor	<p>The operator should not use a sample tap not under the direct control of the water system as the post-treatment sample tap.</p> <p>A sample tap at or within 12 inches of the floor or ground is vulnerable to contamination. It is too close to contaminated surfaces; any water, cleaning products or other sprays directed at the surfaces may splash back to the tap.</p>

Item 49	Does the chlorine compound meet NSF/ANSI Standard 60? Household bleach exempted.
Guidance	Product containers display the NSF/ANSI listing on the label. If the chlorine product comes in a container or packaging that does not display the NSF/ANSI certification, record the manufacturer and the product name in the comment section of Part E on the checklist. Standard household bleach is exempted from the NSF 60 requirement.
How to mark the checklist	Mark as “Yes” if you are certain the chlorine compound is listed under NSF/ANSI Standard 60 (standard household bleach excepted). If the purveyor uses a standard household bleach product that isn’t straight bleach (it contains perfumes, dyes or color), mark this item as “No.”
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-220 WAC 246-290-415 (5)
Publications	
Webpage(s)	
Standard language	Stop adding chlorine compounds not listed under NSF/ANSI Standard 60 to the drinking water supply. Use a chlorine compound listed under NSF/ANSI Standard 60, or use unadulterated household bleach (no detergent, scents, or dye) with a chlorine content of up to 8.25 percent.
Other notes for the sanitary surveyor	If the purveyor is using commercial strength liquid bleach (12.5% and higher), or calcium hypochlorite (“bleach powder” or “HTH” pool bleach disks), check the product label to see if it meets NSF/ANSI Standard 60. If so, it is an acceptable additive for drinking water.

Item 50	Are a backup chemical feed pump or other critical spare parts available onsite?
Guidance	Effective disinfection of the drinking water supply requires continuous treatment. Therefore, unless the purveyor has redundancy of supply through multiple sources or very large reservoir capacity, a spare chemical feed pump is necessary to continue treatment when the operational feed pump is out of service for repair or maintenance.
How to mark the checklist	Mark as “Yes” if the purveyor has a functional spare chemical feed pump ready to be put into service if an operating feed pump breaks or must undergo maintenance.
Classification	Recommendation if marked “No.”
WAC reference	
Publications	
Webpage(s)	
Standard language	We recommend you purchase and maintain a complete spare chlorine injection pump assembly, including injection valve, tubing, pump, and discharge head.
Other notes for the sanitary surveyor	<p>Chemical feed pumps are relatively inexpensive, and require relatively frequent maintenance (cleaning internal wetted parts to remove scale; replace diaphragm; and so forth).</p> <p>The purveyor should also keep a full set of the manufacturer’s spare parts to maintain the spare pump in service-ready condition.</p> <p>You can ask an operator about the bacteriological quality of the source water and the risks that a disinfection chemical feed pump malfunction would create. Planning for emergency conditions, such as chlorination failure, should be part of an Emergency Response Plan.</p>

Item 51	According to the operator, is there a DOH requirement for Chlorine Contact Time? If yes, measure the free chlorine residual at the contact time compliance location.
Guidance	Ask the operator if any source is subject to a chlorination treatment technique requirement known as CT6. If it is, measure the chlorine residual at the CT compliance sampling location. The compliance sampling location must be prior to the first service connection. Then ask the operator to perform the same measurement with his or her own testing apparatus. Record both results on the checklist.
How to mark the checklist	Mark as “Yes” if the purveyor operates a continuous chlorination system and DOH has assigned a CT6 treatment requirement. If you check “Yes,” and we determine the measured free chlorine value is below that necessary to achieve an adequate level of treatment, we will follow-up with the purveyor.
Classification	A referral to the DOH regional engineer for follow-up if marked “Yes” and the measured chlorine residual is insufficient to achieve the required CT value for 4-log virus disinfection before the first customer.
WAC reference	WAC 246-290-451
Publications	Measuring Free Chlorine (331-442) http://www.doh.wa.gov/portals/1/Documents/pubs/331-442.pdf Chlorine contact time for small water systems (331-343) http://www.doh.wa.gov/portals/1/Documents/pubs/331-343.pdf
Webpage(s)	
Standard language	DOH may contact you to inquire further into the level of disinfection achieved prior to the first connection.
Other notes for the sanitary surveyor	<p>“CT6” means chlorine concentration (C) multiplied by contact time (T) must be equal to or greater than 6. A value of 6 is sufficient to provide 4-log (99.99%) inactivation of virus in groundwater.</p> <p>Example: Free chlorine residual of 0.3 mg/l times 20 minutes of contact time between the point of chlorine injection to a point prior to the first connection under peak flow conditions equals 6.</p> <p>A source with a CT6 treatment requirement is most vulnerable to microbiological contamination, and therefore is a high priority for DOH. Such a source has:</p> <ul style="list-style-type: none"> Previously demonstrated vulnerability to fecal contamination as evidenced by <i>E. Coli</i> found in a source water sample; or Previously demonstrated total coliform contamination as evidenced by total coliform found in multiple source water samples; or Microbiological contaminant sources in the sanitary control area and, as a condition of continued operation of the well, the purveyor must provide CT6 treatment.

Item 52	Is the chlorine pump and pump controls constructed and maintained to provide uninterrupted, reliable CT6 treatment?
Guidance	DOH routinely reviews CT6 monthly operational reports submitted by purveyors, to determine compliance with monitoring and treatment technique requirements. If these reports signal a problem, we follow-up. However, looking forward in time, these reports do not tell us whether the treatment process will continue to meet its treatment objectives reliably. Our interest is to prevent interruptions in treatment rather than responding to them after they occur. Look for significant threats to the reliable operation of the disinfection system (see below).
How to mark the checklist	Mark as “Yes” if you believe the chlorination system is currently constructed, operated and maintained to reliably meet its treatment objective. If you mark as “No,” describe your reasons in the comments section of Part E on the checklist.
Classification	A referral for follow-up by the DOH regional engineer if marked “No.”
WAC reference	WAC 246-290-451
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	Based on my observations, I have concerns about the reliability of the CT6 disinfection treatment process. DOH may contact you to inquire further into the condition and operation of your CT6 disinfection treatment system.
Other notes for the sanitary surveyor	Reliability of a CT6 treatment process is a very high priority for DOH. Please record concerns you have about anything to do with the construction, operation or maintenance of a CT6 treatment system. The following is a sample list: <ul style="list-style-type: none"> • Chlorine solution tank is allowed to run dry before re-filling. • The chlorination system operates with a fixed pumping rate, but the water supply being treated flows at a variable rate. • Look for air-locking on the discharge tubing. • Excessive sediment around the foot valve at the bottom of the chlorine solution tank. • Leaks at the pump head or discharge pipe. • Excessively slow pump frequency (anything less than 20% speed).

Checklist Part F: Other Treatment

Third-party surveyors may encounter groundwater treatment other than disinfection, such as iron and manganese removal, corrosion control, or blending. Treatment other than disinfection is intended to reduce the level of contaminants in drinking water.

Contaminants are included into one of three categories. These categories give surveyors an indication of the priority they should apply to resolving treatment reliability issues.

- **Primary acute:** Health based standard that may harm human health as a result of short-term exposure (small amount, even a single dose of water). Examples in groundwater systems include contaminants such as *E. Coli*, viruses, and nitrate.
- **Primary chronic:** Health based standard that may harm human health as a result of long-term exposure (life-time). Examples include lead and copper, arsenic, and fluoride.
- **Secondary:** Aesthetic based standard that is not known to harm human health as a result of short- or long-term exposure. Examples include sulfate and sulfide (rotten egg odor), iron and manganese (odorous, discolored), and chloride (saltwater intrusion).

Topics to describe in the comments section of Part F:

Describe the treatment facilities. Include the purpose for treatment, concerns with maintenance or operations, purveyor's recordkeeping of monthly reports, and sanitary and security observations.

Item 53	Is there any treatment other than chlorination or UV in use?
Guidance	Other treatment includes iron, manganese, nitrate, and arsenic removal; addition of fluoride (for dental health); pH or alkalinity adjustment (for corrosion control); brackish groundwater treatment (by reverse osmosis); aeration (for hydrogen sulfide or corrosion control treatment); and blending two or more sources before entry to the distribution system.
How to mark the checklist	Mark Item 53 as “Yes” if there is any treatment other than chlorination or UV in use.
Classification	Informational
WAC reference	WAC 246-290-110 and 120 WAC 246-290-480
Publications	
Webpage(s)	
Standard language	None
Other notes for the sanitary surveyor	Confirm that the treatment process is listed on the WFI. The pre-survey data packet provides a summary of the treatment processes currently in Sentry (see Section 3.3.2).

Item 54	Did you observe a treatment process connected to the water system in active use that is NOT listed on the WFI?
Guidance	All source treatment information in Sentry is in the pre-survey data packet.
How to mark the checklist	<p>Mark as “Yes” if you observe an operating treatment process not listed in the pre-survey data packet, unless DOH approved the treatment process in writing but didn’t enter the information on to the WFI. (Ask DOH for confirmation).</p> <p>Check with DOH about the treatment process approval status before you complete the sanitary survey cover letter.</p>
Classification	Significant finding if marked “Yes.”
WAC reference	<p>WAC 246-290-110, 120</p> <p>WAC 246-290-250</p> <p>WAC 246-290-415 (5)</p>
Publications	
Webpage(s)	
Standard language	Immediately discontinue use of the unidentified treatment system, physically disconnect the treatment system from the distribution system, and contact the DOH regional engineer for further information on obtaining approval of the treatment system.
Other notes for the sanitary surveyor	

Item 55	Is there a water supply line plumbed directly into a chemical solution tank without a reduced pressure backflow assembly on the supply line?
Guidance	This is a high-risk cross connection. There should be an air gap or reduced pressure backflow assembly between the water supply line and the chlorine solution tank. Without the appropriate backflow protection, a negative pressure event could siphon the content of the chemical solution tank into the supply line, creating a real health hazard.
How to mark the checklist	<p>Mark as “No” if there is no chemical solution tank.</p> <p>Mark as “No” if there is a chemical solution tank but there is no potable water supply pipe hard-plumbed into the solution tank.</p> <p>Mark as “No” if there is a chemical solution tank, there is a potable water supply pipe hard-plumbed into the solution tank, and there is a reduced pressure backflow assembly on the potable water supply pipe to the solution tank.</p>
Classification	Significant deficiency if marked “Yes.”
WAC reference	<p>WAC 246-290-415 (5)</p> <p>WAC 246-290-490</p>
Publications	
Webpage(s)	
Standard language	The cross connection with the chemical solution tank represents a high risk for contamination of the drinking water supply. Install an air gap or reduced pressure backflow assembly on the water supply line to the tank.
Other notes for the sanitary surveyor	Take a picture of the reduced pressure backflow assembly (if applicable).

Item 56	Are primary contaminant treatment facilities (nitrate, corrosion control, arsenic) operating properly?
Guidance	<p>This is a wide open question. Consider the following:</p> <ol style="list-style-type: none"> 1. Observe the condition of the facilities for leaks, vibration, inoperable gauges and sensors. 2. Inquire about the system's operational reliability, operational controls, alarms, alarm set points, and alarm testing. 3. Identify the presence of a treatment by-pass and how/when is it used. 4. Describe where field and compliance (lab) samples are collected and under what conditions. 5. Confirm that any chemicals and media materials in use are NSF/ANSI Standard 60 and 61 approved. 6. Confirm that O&M is performed as needed (such as the correct backwash frequency, duration, flow; appropriate process control on chemical feed). 7. Confirm that treatment backwash (if any) doesn't represent a cross-connection hazard.
How to mark the checklist	<p>Mark as "Yes" if you believe the treatment system is currently constructed, operated, and maintained to reliably meet its treatment objective.</p> <p>Mark as "No" if you discover significant defects in the construction, maintenance or operation of the facility that present a high risk of equipment failure, failure to remove the contaminant reliably, or other threat of contamination to the drinking water supply.</p> <p>If you mark as "No," describe in the comments section of Part F in the checklist.</p>
Classification	Significant deficiency if marked "No."
WAC reference	<p>WAC 246-290-415 (3), (4), (5)</p> <p>WAC 246-290-455 (1)</p>
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351)</p> <p>http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p>
Webpage(s)	
Standard language	The _____ (describe the problem(s)) pose(s) an unreasonable risk to the safety of the drinking water supply. Submit to DOH your plan to address this problem.
Other notes for the sanitary surveyor	

Item 57	Do the water treatment chemicals meet NSF/ANSI Standard 60?
Guidance	Product containers will display the NSF/ANSI listing on the label. If the product used as an additive to drinking water comes in a container or packaging that does not display the NSF/ANSI certification, record the manufacturer and product name in the comment section of Part F on the checklist.
How to mark the checklist	Mark as “Yes” if you are certain the chemicals used are listed under NSF/ANSI Standard 60 (standard household bleach excepted). Mark as “No” if the purveyor cannot provide you with confirmation that the product used is listed under NSF/ANSI Standard 60.
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-220 WAC 246-290-415 (5)
Publications	
Webpage(s)	
Standard language	Cease adding a product not listed under NSF/ANSI Standard 60 to the drinking water supply. Visit http://www.nsf.org/certified/consumer/listings_main.asp to find an alternative product listed under Standard 60.
Other notes for the sanitary surveyor	

Item 58	Is there a post-treatment sample tap?
Guidance	Operators must take all source samples for analytes, such as VOCs, IOCs, radionuclides, and SOC, at the source, prior to entry into the distribution system and after treatment. This post-treatment sampling will confirm changes in the analytes that occur as a result of treatment (addition of a chemical or physical change).
How to mark the checklist	Mark as “Yes” if there is a post-treatment sample tap located prior to entry to the distribution system.
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-300 WAC 246-290-415 (5)
Publications	<i>Inorganic Chemical (IOC) Sampling Procedure</i> (331-221) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-221.pdf
Webpage(s)	
Standard language	Install a water sampling tap after all forms of water treatment at S0_. You must be able to collect a post-treatment water sample prior to entry to the distribution system to comply with routine source monitoring requirements in chapter 246-290 WAC.
Other notes for the sanitary surveyor	<p>The operator should not use a sample tap not under the direct control of the water system as the post-treatment sample tap.</p> <p>A sample tap at or within 12 inches of the floor or ground is vulnerable to contamination. It is too close to contaminated surfaces: any water, cleaning products or other sprays directed at the surfaces may splash back to the tap.</p>

Checklist Part G: Booster Pumps and Controls

Pumps supply the energy required to get water out of the source to consumers' taps under a useful pressure. Pumps used in water systems are usually centrifugal, including submersible pumps and line-shaft turbine pumps. A centrifugal pump consists of an impeller rotating within a case. Practically all submersible and line-shaft turbine use multiple stages of impellers, with each stage "pumping" water to the next, to create the right amount of pressure needed to deliver the water from the source to each consumer.

Rotation of the impeller occurs when electrical energy in a motor turns a shaft connected to the impeller(s). When someone refers to a "10 horse pump," he or she is referring to the horsepower of the motor connected to the impellers. The needed horsepower is a function of the flow that must be delivered into the water system, and the pressure at which it must be delivered.

One pump coupled to a 10-hp motor may be installed to pump a relatively small amount of water up to a very high pressure. A different pump coupled with a 10-hp motor may be installed to pump a large amount of water up to a relatively low pressure. The specific requirements of the source and the water system drive the selection of the pump. The size of the motor is based on the pump selected.

Control systems start and stop pumps.

Pump control for a system operating with pressure tanks is based on pressure. When the pressure reaches a pre-set high value, the pump is shut off automatically; and, when the pressure reaches a pre-set low value, the pump is started automatically.

Pump control for a system operating with a storage tank that is not under internal pressure is based on the water level in the tank. When the water level reaches a pre-set high level, the pump is shut off; and when the water level reaches a pre-set low level, the pump is started.

While pumps are big, expensive, and sometimes noisy, control systems are usually quite small, inexpensive, and virtually silent. A pressure switch controlling a \$4,000 pump might cost \$25. The level control in a storage tank controlling a 50 horsepower pump might cost \$50 and be disabled the next time ice forms in the tank. It's important to pay attention to what starts and stops a pump.

Pump failure may increase the risk of contamination, and create considerable inconvenience to the community served. The situation representing the highest risk is a small system supplied by a single well and pressure tank(s). Within moments of well pump failure, the system will lose supply and pressure. Loss of pressure means an increased risk posed by uncontrolled cross connections in the distribution system, and the likelihood that the purveyor and consumers will seek out an alternative water supply.

Pump failure may not be as critical if there are multiple sources or a finished water storage tank large enough to supply consumers by gravity until the pump is repaired or replaced.

Topics to describe in the comments section of Part G:

Describe and evaluate the pump facilities and controls including maintenance, operations, sanitary and security observations.

Item 59	Are there any booster pumps in use?
Guidance	Include well pumps and booster pumps. Do not include small pumps used exclusively for treatment (chemical feed pumps) because they should be addressed under the treatment section of the checklist.
How to mark the checklist	Mark as “Yes” if there is at least one booster pump that must operate to maintain an adequate level of service in the distribution system during peak demand periods and fire flow events (if applicable).
Classification	Informational
WAC reference	
Publications	
Webpage(s)	
Standard language	
Other notes for the sanitary surveyor	

Item 60	Are the booster pumps in good working condition?
Guidance	<p>Look for:</p> <ul style="list-style-type: none"> • Excessive vibration (evidence of misaligned shaft, pump impeller imbalance or motor imbalance). • A deep swishing noise coming from the pump casing (possible cavitation). • Excessive water leakage around the pump shaft seals (some water leakage is necessary, but excessive leakage indicates that the mechanical seals or packing material may be shot and should be replaced). • Inadequate structural support for pumps (broken concrete pump pedestals, missing anchor bolts, insufficient pipe support around the pump suction and discharge). • Sparking from the pump motor. • The smell of something burning. • History (told by the operator) of motor overheating (tripping the breaker).
How to mark the checklist	Mark as “Yes” if you believe the booster pumps are in good working condition.
Classification	Recommendation if marked “No.”
WAC reference	
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p>
Webpage(s)	
Standard language	Your booster pumps appear to be in poor condition. We recommend you _____ (state the concern) your booster pumps to maintain safe and reliable operations.
Other notes for the sanitary surveyor	This item is a precursor to Item 61, which gets to the issue of the reliability of the booster pumping system to maintain reliable water service.

Item 61	Are pump and pump controls operational and adequate to prevent chronic water outages or premature pump failure?
Guidance	If the booster pump fails, and there is no other pump or atmospheric storage, then the system will be quickly depressurized. We are interested in identifying threats that could result in depressurizing the water system. See examples below.
How to mark the checklist	<p>Mark as “Yes” if you believe the pump and pump control system(s) is currently constructed, operated, and maintained to prevent chronic water outages or premature pump failure.</p> <p>Mark as “No” if you discover significant defects in the construction, maintenance, or operation of pump and pump controls that present a high risk of equipment failure or failure to maintain pressure in the distribution system.</p> <p>If you mark as “No,” describe in the comments section of Part D on the checklist.</p>
Classification	Significant deficiency if marked “No.”
WAC reference	WAC 246-290-415 (5)
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p> <p><i>Pump Controls</i> (331-401) http://www.doh.wa.gov/portals/1/Documents/pubs/331-401.pdf</p>
Webpage(s)	
Standard language	The _____ (describe the problem(s)) pose(s) an unreasonable risk to the reliability of the drinking water supply. Submit to DOH your plan to address this problem.

Other notes for the sanitary surveyor	<p>Examples of circumstances that can lead to premature pump failure include:</p> <ol style="list-style-type: none"> 1. A pump cycling on/off too frequently is a pump with a short motor life. The build-up of heat generated at motor start-up causes motor failure. If the time between start-ups is too short to allow this heat to dissipate, the electric motor will eventually overheat. We suggest no more than six starts per hour unless the operator can prove the pump motor manufacturer claims a greater start-per-hour allowance. 2. Recycling pump discharge through a PRV back to the suction side of the pump, at a very low flow rate, for extended periods will heat up the water. This causes increased risk of cavitation, which threatens pump failure. Operating at a low flow rate will likely mean the pump is operating near its shutoff head (unless it's equipped with a variable frequency drive). This causes imbalances of forces on thrust bearings, which can cause premature failure of the pump. 3. Rapid change from low to high flow rate or vice versa (immediate start-up and immediate shutdown) can cause a telltale water hammer. Transient pressure waves that cause banging pipes and equipment can blow fittings and pump casings. 4. Net positive suction head (NPSH) is the head on the suction side of the pump. Pumps require NPSH to function. If the reservoir level or distribution system pressure that the pump pulls from drops too low, the pump will continue to operate but little or nothing will be pumped. Cavitation may occur, leading to pump failure. 5. Wells that experience significant drawdown or seasonal decline in aquifer level are a potential risk to the well pump. Without a well level sensing device to shut the well pump off, drawdown to the well pump will cause air to enter the pump, causing cavitation. <p>Examples of pump controls that can lead to depressurization of part or all of the water system:</p> <ul style="list-style-type: none"> • The setting for pump-on and pump-off is such that pressure within certain parts of the distribution system experience very low pressure. • The pump control valve isn't working properly, which keeps the pump from coming on or shutting off. Well pump control valves often have limit switches, which measure the open or closed position of the valve. If the limit switch isn't set correctly, it can cause the pump to operate outside its intended logic control. <p>Read our guidance on Pump Controls¹⁴ (331-401).</p> <p>See Item 65 on pressure tanks. If the condition of one or more pressure tanks poses a risk of failure of the pumping system, note this in the comments section of Parts G and H.</p>
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¹⁴ <http://www.doh.wa.gov/portals/1/Documents/pubs/331-401.pdf>

Item 62	If there is a booster pump house or pump station, is it secure against unauthorized entry?
Guidance	The pump house should be constructed of rigid walls (tarps covering decayed or damaged walls is unacceptable). The water system should make sure the door(s) and window(s) are locked or otherwise secured against unauthorized entry. There may be other acceptable ways to secure the pump house. For example, a perimeter fence with a locking gate may replace the need to lock the pump house
How to mark the checklist	Mark as “Yes” if you believe the booster pump station is adequately protected from unauthorized entry.
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-415 (5) WAC 246-290-415 (8)
Publications	<i>Responding to a threat against a water system</i> (331-183) http://www.doh.wa.gov/portals/1/Documents/pubs/331-183.pdf <i>Water System Security and Emergency Response Planning</i> (331-199) http://www.doh.wa.gov/portals/1/Documents/pubs/331-199.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyResponseandSecurity.aspx
Standard language	<p>If the issue is simply ensuring doors and windows are locked:</p> <p>You must secure the pump house against unauthorized entry. Install locks and lock all entries to the pump house. Keep windows locked or otherwise prevent unauthorized entry.</p> <p>If the issue of booster pump station security is more complex:</p> <p>The interior of the booster pump station is vulnerable to vandalism and unauthorized entry due to _____. You must submit a plan to DOH to secure the booster pump station against unauthorized entry.</p>
Other notes for the sanitary surveyor	

Item 63	Is the booster pump house properly constructed and maintained?
Guidance	It is safe to enter most booster pump houses. However, if you consider a structure unstable or in such disrepair that entry is unsafe, DO NOT ENTER the structure. Record on the checklist and photograph the condition of the structure. DOH will follow-up with the purveyor to ensure the structure is safe, or restored to a safe condition.
How to mark the checklist	Mark as “Yes” if the booster pump house was constructed of durable materials, is weatherproof, has a source of heat (if in a freezing climate), and is free of obvious electrical or mechanical hazards.
Classification	Recommendation if marked “No.” (If the pump house condition is so bad that it is unsafe to enter, don’t enter. Identify the problem as a significant finding in the comments section.)
WAC reference	
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	We recommend that you improve the structural integrity of the booster pump house. The structural integrity of the booster pump house is important. It protects and maintains electrical and mechanical equipment essential to the proper functioning of your water system.
Other notes for the sanitary surveyor	Record observations if there is a risk of freezing (no reliable heat source; insufficient insulation); leaking roof; leaking pipes; standing water; obvious physical or electrical hazards (confined space, unsafe wiring); or severe corrosion. If the booster pump house condition compromises security and leaves the structure vulnerable to unauthorized entry, address this through Item 62.

Checklist Part H: Pressure Tanks

Water systems install pressure tanks to allow the source pump to shut down when water demand drops below the level at which the well pump was designed to operate. If a water system has a single-speed well pump, there is a particular operating range most suitable for that pump. Pumping at a rate below that operating range will result in excessive pressure and premature pump failure. Pressure tanks release a supply of water to the system while the well pump is off.

A variable speed drive (also called variable frequency) on the pump motor can operate at a very low pumping rate without over-pressurizing the water system. If a water system has a variable speed drive on the pump motor, the size and number of needed pressure is dramatically reduced.

Topics to describe in the comments section of Part H:

Describe and evaluate the pressure tanks, including maintenance, and operational, sanitary and security observations.

Item 64	Are there any pressure tanks in use?
Guidance	Include hydropneumatic and bladder pressure tanks.
How to mark the checklist	Mark as “Yes” if there are any bladder tanks or hydropneumatic tanks in active service.
Classification	Informational
WAC reference	
Publications	<p><i>Hydropneumatic Tanks</i> (331-380) http://www.doh.wa.gov/portals/1/Documents/pubs/331-380.pdf.</p> <p><i>Pressure Relief Valves on Pressure Tanks</i> (331-429) http://www.doh.wa.gov/portals/1/Documents/pubs/331-429.pdf</p> <p><i>Troubleshooting Bladder Pressure Tanks</i> (331-342) http://www.doh.wa.gov/portals/1/Documents/pubs/331-342.pdf</p>
Webpage(s)	
Standard language	
Other notes for the sanitary surveyor	

Item 65	For systems using an air compressor, is the compressor an oil-free type or does it use food-grade oil?
Guidance	If the compressor uses nonfood-grade oil as an engine lubricant, some of that oil can leak around the O-ring into the air supply going into the tank (and will leak in older or poorly constructed or maintained compressors). Over time, oil can build up on top of the water in the tank, contaminating the supply.
How to mark the checklist	Mark as “Yes” if the compressor is an oil-free type, or the engine lubricant for the compressor is food-grade oil. Mark as “No” if the compressor is oil-lubricated and the oil lubricant is not food-grade. Mark as “N/A” if there is no compressor.
Classification	Significant finding if marked “No.”
WAC reference	WAC 246-290-220 WAC 246-290-415 (5)
Publications	<i>Hydropneumatic Tanks</i> http://www.doh.wa.gov/portals/1/Documents/pubs/331-380.pdf .
Webpage(s)	
Standard language	The existing compressor uses oil to lubricate pneumatic tools that may add oil to the air stream entering the hydropneumatic tank. Replace it with a compressor that uses food-grade oil for lubrication, or an oil-free compressor. We recommend you inspect the inside of the pressure tank and remove any residual oil.
Other notes for the sanitary surveyor	Almost all hydropneumatic tanks require an air compressor and compressor controls to maintain the proper range of air and water in the tank. A hydropneumatic tank successfully operates in a range of about 40 to 60 percent air. Too much air or too much water will decrease the effectiveness of the tank, and result in excessive on/off cycling of the pump(s) connected to the tank.

Item 66	Are valves present to isolate pressure tanks for maintenance or repair?
Guidance	Hydropneumatic tanks require periodic cleaning, repair, re-coating, and so forth. Bladder tanks require periodic replacement. An isolation valve will enable the operator to work on one of these tanks while maintaining water service.
How to mark the checklist	Mark as “Yes” if there are shut-off valves in position to isolate each pressure tank, or at least a portion of the pressure tanks in service. The intention is to identify whether the capacity exists to repair or replace a pressure tank without having to shut down the water system.
Classification	Recommendation if marked “No.”
WAC reference	
Publications	<i>Pressure Relief Valves on Pressure Tanks</i> (331-429) http://www.doh.wa.gov/portals/1/Documents/pubs/331-429.pdf
Webpage(s)	
Standard language	We recommend installing isolation valves on each pressure tank during the next scheduled shutdown of the water system. These valves will enable you to repair or replace each tank without needing to shut down the water system and interrupt water service.
Other notes for the sanitary surveyor	

Item 67	Is there an ASME pressure relief valve installed between each pressure tank and any shutoff valve?
Guidance	There are significant safety and reliability hazards associated with the sudden and catastrophic failure of a pressure tank. An appropriately sized and located ASME pressure relief valve (PRV) must be installed at all pressure tanks, including bladder tanks and hydropneumatic tanks. The capacity of the PRV must be sufficient to handle the pump(s)' full rate of flow at pressure-vessel design limit.
How to mark the checklist	Mark as "No" if ASME pressure relief valves are not in place as shown in Pressure Relief Valves on Pressure Tanks (331-429) .
Classification	Observation if marked "No."
WAC reference	WAC 246-290-200 WAC 246-290-415 (5)
Publications	Pressure Relief Valves on Pressure Tanks (331-429) http://www.doh.wa.gov/portals/1/Documents/pubs/331-429.pdf
Webpage(s)	
Standard language	WAC 246-290-200 requires the application of good engineering criteria in the construction of public water systems. The state departments of Labor and Industries (L&I) and Health agree that an adequately sized ASME-approved pressure relief valve must be installed in the water piping adjacent to the pressure tank. If there is a tank isolation valve, the pressure relief valve needs to be on the tank side of the isolation valve.
Other notes for the sanitary surveyor	<p>"ASME" stands for American Society of Mechanical Engineers.</p> <p>Bladder tanks greater than 37.5 gallons in (gross) size must be constructed to ASME standards (RCW 70.79). Very few of the pressure tanks installed in service to public drinking water systems meet this standard for construction.</p> <p>L&I and DOH have a general agreement on the use of non-ASME bladder tanks (until legislation is changed). L&I supports DOH's practice of approving non-ASME bladder tanks for public water system use as shown in Pressure Relief Valves on Pressure Tanks (331-429) because:</p> <ul style="list-style-type: none"> • The DOH standard does not represent an unsafe environment or promote an unsafe practice. • The DOH standard avoids creating an undue economic hardship and economic distress among the regulated community. <p>Identifying an ASME pressure relief valve All pressure relief valves built according to ASME Section VIII must have specific information on a nameplate attached to the valve:</p> <ul style="list-style-type: none"> • The manufacturer's name. • The rated flow capacity at an overpressure of 10 percent or 3 psi of the set pressure. • The valve model number, set pressure, and inlet size. <p>You can identify a pressure relief valve certified to ASME Section VIII by locating a "UV" stamped on the nameplate.</p>

Item 68	Are the pressure tanks in good working condition?
Guidance	<p>For hydropneumatic tanks, identify:</p> <ol style="list-style-type: none"> 1. Leaks 2. Excessive rust 3. Inaccessible, inoperable, or non-existent access hatches 4. Inoperable air-water level control systems 5. Inappropriate operating air-water level (condensation or a visual level gauge may provide clues to the air-water interface level and whether the tank is water-logged) <p>For bladder tanks, identify:</p> <ol style="list-style-type: none"> 1. Leaks 2. Dents 3. Excessive rust
How to mark the checklist	<p>Mark as “Yes” if you believe all the pressure tanks are in good working condition.</p> <p>Mark as “No” if you discover significant defects in the construction, maintenance, or condition of a pressure tank that present a high risk of pressure tank failure.</p> <p>If you mark as “No,” describe in the comments section of Part H on the checklist.</p>
Classification	Recommendation if marked “No.”
WAC reference	
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351)</p> <p>http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p>
Webpage(s)	
Standard language	We recommend you _____ (state the concern) your pressure tanks to maintain safe and reliable operations.
Other notes for the sanitary surveyor	Refer to checklist Item 33 and Item 61 if the condition of one or more pressure tanks poses a systemic risk to the pumping system’s ability to maintain pressure in the distribution system.

Checklist Part I: Finished Water Storage

The surface of the water inside a finished water storage tank is under atmospheric pressure, like the surface of the water in a bucket. Typical reasons for a finished water storage tank are to:

- Supplement what is delivered from the well(s) to meet peak consumer demand.
- Store water for use during source failure.
- Store water for use to fight a fire.
- Allow the source pump(s) to shut down.
- Provide for contact time in support of a treatment objective. (Typically, increasing “T” in the $C \times T$ equation for groundwater disinfection before the first connection.)

Finished water storage installations may require pumping water out of the tank or may allow water to flow by gravity from the tank into the distribution system. Tanks designed to pump water to the distribution system are usually near the well, and modest in height. Some may even be partially or completely buried.

Tanks designed to allow water to flow by gravity must be constructed so that the low operating level of the tank is at least 70 feet above the highest customer, to provide the minimum required service pressure (30 psi during peak demand).

Second only to sources, storage tanks are the most scrutinized component of a small water system. The survey checklist reflects this by the number of questions that represent significant deficiencies and significant findings. The reason for this is simple: storage tanks (like the water in a well) operate under atmospheric pressure. It’s much easier for a contaminant to enter a storage tank than a pressurized element of the water system.

Topics to describe in the comments section of Part I:

Describe and evaluate the finished water storage facilities including volume, operational drawdown, configuration of the inlet and outlet piping, any concerns about operations and maintenance, and sanitary and security observations.

Item 69	Is there a finished water storage tank in use?
Guidance	Include all water storage tanks containing potable water, even those that are small and exist as part of the source of supply (a wet well).
How to mark the checklist	Mark as “Yes” if there is a storage tank operating with finished potable water.
Classification	Informational
WAC reference	WAC 246-290-010 Definitions
Publications	
Webpage(s)	
Standard language	
Other notes for the sanitary surveyor	Pressure tanks are not finished water storage tanks. A finished water storage facility is a water storage structure that is integrated with a water system's distribution network to provide for variable system demands. These include, but aren't limited to, daily equalizing storage, standby storage, fire reserves, or providing for disinfectant contact time.

Item 70	<p>If unable to physically inspect the reservoir hatch, vent, roof, or overflow outlet, select the method you discussed with the purveyor to document their condition:</p> <ul style="list-style-type: none"> a. Reviewed and discussed maintenance records and recent photos. b. Photos will be taken and mailed by purveyor. Additional follow-up required by DOH. c. Purveyor unable or unwilling to document. Additional follow-up required by DOH.
Guidance	See Section 3.1.1. If the purveyor provides recent photos of the reservoir roof and its appurtenances, the surveyor should take them as part of the survey record. If the purveyor can't provide the surveyor with recent photos of the reservoir roof and its appurtenances, then s/he should determine whether (b) or (c) above applies and mark the checklist accordingly.
How to mark the checklist	Check the one box that best describes the circumstance (70a, 70b, or 70c).
Classification	<p>Significant finding if the surveyor checks Box 70b or 70c.</p> <p>If you check "unk" in Item 71, 72, 73, 75, 76, 79, or 80, you should also check Box 70b or 70c .</p>
WAC reference	<p>WAC 246-290-416 Sanitary Surveys</p> <p>WAC 246-290-415 Operations and Maintenance</p>
Publications	<p>For community systems: <i>Small Water System Management Program Guide</i> (331-134) http://www.doh.wa.gov/portals/1/Documents/pubs/331-134.doc</p> <p><i>Noncommunity Small Water System Management Program Guide</i> (331-474) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-474.pdf</p> <p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p>
Webpage(s)	
Standard language	Provide DOH with digital or paper photos of the reservoir hatch, vent and overflow outlet. The photos must provide enough detail to determine whether these features safeguard the storage tank against the entry of contaminants into the public drinking water supply.
Other notes for the sanitary surveyor	<p>Photos of storage tank hatch, vent, overflow outlet, and so on should be no more than 12 months old.</p> <p>The operator should routinely inspect storage tanks' interior and exterior (including the tops), hatches and seal gaskets, vents and screens, overflows and water quality as part of a written Operations and Maintenance Program. The operator should maintain records of routine and emergency maintenance, self-inspections and other operational activities.</p> <p>Ask the operator how often he or she inspects the reservoir roof.</p>

Item 71	Is the storage tank protected from unauthorized entry or vandalism?
Guidance	<p>Each storage tank must be secured to deter unauthorized entry into the structure. Probably the most common, accepted method for storage tank security includes a perimeter 6-foot chain-link fence with three-strands of barbed wire atop the fence, a locked fence gate combined with a locked gate at the base of the access ladder cage, and a lock on the reservoir roof hatch.</p> <p>When evaluating reservoir security, you should consider the location, visibility and size of the tank. You should not consider a perimeter fence a requirement for securing the storage tank against unauthorized entry. However, you should require some kind of locking mechanism on each roof access hatch. The hatch should be made of strong, durable material.</p>
How to mark the checklist	Mark as “Yes” if you believe the storage tank is protected adequately from unauthorized entry.
Classification	Significant finding if marked “No.” If unknown, mark “unk” and refer to Item 70.
WAC reference	<p>WAC 246-290-235</p> <p>WAC 246-290-415 (5)</p> <p>WAC 246-290-415 (8)</p>
Publications	<p><i>Responding to a threat against a water system</i> (331-183) http://www.doh.wa.gov/portals/1/Documents/pubs/331-183.pdf</p> <p><i>Water System Security and Emergency Response Planning</i> (331-199) http://www.doh.wa.gov/portals/1/Documents/pubs/331-199.pdf</p>
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyResponseandSecurity.aspx
Standard language	<p>If the issue is simply ensuring the roof hatch is locked:</p> <p>You must secure the storage tank access hatch against unauthorized entry. Install a lock and keep it locked at all times.</p> <p>If the issue of reservoir security is more complex:</p> <p>The storage tank is vulnerable to vandalism and unauthorized entry due to _____. You must submit a plan to DOH to secure the storage tank against unauthorized entry.</p>
Other notes for the sanitary surveyor	<p>Some storage tanks are in remote locations, with little or no regular surveillance by law enforcement, water system staff or even concerned customers. Consequently, some storage tanks make easy targets for vandalism and other intentional acts of sabotage. Storage tanks are the most frequent water infrastructure target of vandals.</p> <p>In some settings, storage tanks are used as a base to install telecommunications equipment. This usually means the phone company has a set of keys to gain unrestricted access to the top of the storage tanks. Handing out keys to non-utility personnel increases the risk that unauthorized people can achieve undeterred access.</p> <p>Each storage tank must be constructed and maintained to deter unauthorized entry to the reservoir or vandalism (damaging or destroying barriers to contamination or intentionally inserting contaminated material into the storage tank). DOH expects purveyors to lock each storage tank hatch or bolt it in place with bolts that require a special tool to remove. Access to the top of the reservoir should be secured so that only authorized persons may climb the tank.</p> <p>If you mark this or other storage tank checklist items as “unknown” (unk), DOH will interpret that to mean that the tank component cannot be found or the operator hasn’t provided a recent</p>

	photograph that enables the surveyor to answer the question with confidence.
Item 72	Is the reservoir roof free of any unprotected openings?
Guidance	You should make sure there are no holes in the reservoir roof that could allow contaminants to enter the finished water tank. This item is for conditions not addressed by Item 73 (reservoir hatch) or Item 75 (reservoir vent).
How to mark the checklist	Mark as “Yes” if the design, construction and condition of the roof provide no openings or other ways for contaminants, such as rainwater runoff, animals or birds, or waste from animals or birds (droppings) to enter the drinking water supply. You should note even a small hole.
Classification	Significant deficiency if marked “No.” If unknown, mark “unk” and refer to Item 70.
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 (5)
Publications	
Webpage(s)	
Standard language	The _____ (describe the condition that must be corrected) must be sealed to prevent the entry of contaminants into the public drinking water supply.
Other notes for the sanitary surveyor	<p>Openings may include the holes made in the reservoir roof to pass electrical wires, level indicator or abandoned structural elements.</p> <p>Cracks and gaps in concrete (most likely present in a “cold joint” in the concrete reservoir) are also entry points that may be located between the roof and the top of the sidewall of the reservoir.</p>

Item 73	Was the access hatch constructed and sealed to prevent the entry of contaminants?
Guidance	<p>The access hatch must be weatherproof. It should prevent any amount of rainfall, snowmelt, and so on from entering the reservoir.</p> <p>The publication referenced below shows the ideal access hatch cover.</p>
How to mark the checklist	Mark as “Yes” if the design, construction and condition of the hatch provide no openings or other means for contaminants to enter the drinking water supply (such as rainwater runoff, animals or birds, or waste from animals or birds. You should note even a small hole in the hatch assembly or cover, a misaligned or missing seal, or ill-fitting framing.
Classification	Significant deficiency if marked “No.” If unknown, mark “unk” and refer to Item 70.
WAC reference	<p>WAC 246-290-235 (1)</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Sanitary Protection of Reservoirs: Hatches</i> (331-249)</p> <p>http://www.doh.wa.gov/portals/1/Documents/pubs/331-249.pdf</p>
Webpage(s)	
Standard language	The access hatch needs modifications so that the sides overlap a raised curb with gasket on the tank. The hatch cover must be locked. The appropriate standard for a storage tank access hatch is in <i>Sanitary Protection of Reservoirs: Hatches</i> (331-249).
Other notes for the sanitary surveyor	<p>You may elaborate on specific measures the owner or operator should take to modify the access itself.</p> <p>A manhole cover used as a reservoir hatch is a significant deficiency unless the manhole cover is waterproof and an operator can clean the top of the cover before “flipping it” up and away from the opening. It is very rare to find a waterproof manhole cover.</p> <p>Some cylindrical steel storage tanks have hatches that are bolted-flanged construction with a rubber gasket seal. These may be more difficult to inspect because operators are reluctant to unbolt them and potentially damage the gasket material. This may result in never opening them for routine inspection or maintenance.</p> <p>Custom-made retrofit access hatches are available from vendors and fabricators including the Mt Baker Silo company.</p>

Item 74	If able to open the hatch, is the stored water free of visible contaminants?
Guidance	<p>Ask the operator about the risk to water quality and effort involved in opening the hatch. You should not open the hatch, even with the operator's approval. The operator should do it. Remember, the interior of a reservoir is a confined space and you should not enter.</p> <p>From above the top of the hatch, you should look for the following inside the reservoir:</p> <ul style="list-style-type: none"> • Insects, dead birds, reptiles, or other small animals. • Evidence of live birds, bats, and small mammals nesting inside the reservoir. • Cloudiness in the water column's appearance. • Sheen or scum layer on top of the water. • Damage to internal components (such as broken mercury level switches at the bottom of the reservoir). • Roots that penetrate through the reservoir walls or floor. <p>If possible, photograph the item(s) you see inside the reservoir, and record them in the comment section in Part I of the checklist.</p>
How to mark the checklist	<p>Mark as "Yes" if the stored water appears free of visible contaminants.</p> <p>Mark as unknown (unk) if the operator didn't open the hatch for your visual inspection.</p>
Classification	Significant deficiency if you see any animal inside the reservoir (alive or dead); or you observe proof that an animal has access into the reservoir interior (droppings, nests, and so on).
WAC reference	<p>WAC 246-290-235 (1)</p> <p>WAC 246-290-415(5)</p>
Publications	
Webpage(s)	
Standard language	<p>Complete an inspection of the storage tank. Repair or replace any defect that may allow animals to enter.</p> <p>If you observe evidence of animal contamination (a dead animal or animal waste), add the following:</p> <p>Isolate the reservoir from the distribution system, drain the reservoir, remove all contaminants, refill and disinfect the reservoir with 10 mg/l of free chlorine for 24 hours, drain the reservoir at the end of the 24-hour disinfection period, and then contact the DOH regional office.</p>
Other notes for the sanitary surveyor	<p>Wood stave reservoirs and reservoirs constructed with a concrete foundation and a wood-truss roof are particularly vulnerable to contaminants. You should carefully scrutinize these reservoirs during your inspection. Do not allow a "clean" coliform sampling record to deter a thorough inspection of the interior, exterior and sill space (between concrete and wood). Poor initial construction, weather, wood rot (there is a lot of condensation inside these reservoirs), birds (woodpeckers), bats, rodents and destructive insects all contribute to the risk of a contaminant pathway into the reservoir.</p> <p>Stored water with elevated iron or manganese is at higher risk of iron or manganese bacteria that create a sheen or crusty material on the surface.</p>

Item 75 and 75a	Is there a dedicated air vent on the storage tank? If yes, was the air vent constructed to prevent the entry of contaminants?
Guidance	Air vents on storage tanks maintain atmospheric pressure within the tank during tank filling and tank draw.
How to mark the checklist	Mark as “Yes” if the design, construction and condition of the vent provide no openings or other means for contaminants to enter the drinking water supply (such as rainwater runoff, animals or birds, or waste from animals or birds (droppings)). You should note even an ill-fitted screen or a small hole in the screen.
Classification	Observation if Item 75 marked “No.” If unknown, mark “unk” and refer to Item 70. Significant deficiency if Item 75a marked “No.” If unknown, mark “unk” and refer to Item 70.
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 (5)
Publications	Sanitary Protection of Reservoirs - Vents (331-250) http://www.doh.wa.gov/portals/1/Documents/pubs/331-250.pdf
Webpage(s)	
Standard language	If Item 75 is marked “No”: Finished water storage facilities must have a screened atmospheric vent (WAC 246-290-235). Consult with DOH on how to provide proper venting for your storage tank. If Item 75a is marked “No”: The storage tank vent requires modification so that the vent does not permit contaminants to enter the public drinking water supply. See the appropriate standards for finished water storage tank vents in Sanitary Protection of Reservoirs - Vents (331-250).
Other notes for the sanitary surveyor	You may elaborate on specific measures the owner or operator should take to modify the air vent. Contaminants can enter the reservoir through the venting several ways. For example, the mesh size on the screens may be too large to exclude insects (larger than 24 mesh). The vent design and location may allow airborne, dust-borne, rain-borne and splatter-driven contaminants into the tank. The vent may not be sealed adequately to the top of the reservoir allowing surface runoff to seep or flow into the tank. Vents with openings not elevated far enough above the reservoir top can draw in contaminants (design standards require a 1- to 2-foot vertical elevation). Vent openings may be horizontal, where the screen over the horizontal opening allows a perfect setting for an animal to nest. Even though the opening is screened, contaminants can enter the tank through the screen. This type of vent must be reconstructed. If vents are damaged, beat up, or need to be wrapped in screens, they probably should be replaced with a new type that provides better sanitary protection, security and durability. Higher quality vents protect against icing, frost build up, tampering, and negative and positive air pressures. Turbine type spinning vents should be replaced. Semi-buried concrete tanks may have small vent openings in the vertical wall. These need to have shields to direct the opening downward.

Item 76	Is the overflow line constructed to prevent contaminants from entering the tank?
Guidance	<p>Each storage tank should have an overflow. If the system that controls water-flow into the reservoir fails, the overflow provides a deliberate, safe passage for excess water to leave the tank before excess water pressure threatens the structure.</p> <p>Because there is a direct pathway from the overflow outfall into the tank, the outfall must have a barrier to keep small animals and birds from entering the overflow pipe.</p> <p>There is no concern with a tank overflow-line and drain-line sharing a common outfall.</p> <p>You should visually inspect the outfall of every storage tank overflow. Past discharge (either from an overflow or deliberate draining) through the outfall may damage or loosen the device used to prevent animals from entering the reservoir.</p>
How to mark the checklist	Mark as “Yes” if the design, construction and condition of the overflow provide no openings or other ways for contaminants to enter the drinking water supply (such as surface water runoff, animals or birds).
Classification	Significant deficiency if marked “No.” If unknown, mark “unk” and refer to Item 70.
WAC reference	<p>WAC 246-290-235 (1)</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Sanitary Protection of Reservoirs - Vents</i> (331-250)</p> <p>http://www.doh.wa.gov/portals/1/Documents/pubs/331-250.pdf</p>
Webpage(s)	
Standard language	The end of the overflow pipe must be protected with 4-mesh non-corrodible screen or covered with a flapper valve to prevent entry of birds, rodents, and the like. Insect screen can be installed on the inside of the 4-mesh screen. See appropriate ways to reduce the risk of contamination through the overflow in <i>Sanitary Protection of Reservoirs - Vents</i> (331-250).
Other notes for the sanitary surveyor	<p>You may elaborate on specific measures the owner or operator should take to modify the overflow outfall.</p> <p>For reservoirs with the roof at or near ground level, surveyors should make sure</p> <ul style="list-style-type: none"> • The overflow cannot actually drain overflow waste (or other water that contacts the surrounding environment) back into the reservoir. • Flap valves at the overflow outfall close tightly against the end of the pipe. <p>Overflow discharge outlets should have visible screens, flexible check valves, or flapper valves. The installation of a flapper valve or flexible check valve should allow the valve to close fully. Mice can enter a space that’s less than 1 inch in size.</p> <p>If there is no overflow:</p> <p>Without an overflow, the storage tank may be at risk to structural damage, or damage to the hatch or atmospheric vent if the reservoir overfills. If the tank doesn’t have an overflow pipe, document this as an observation in the cover letter:</p> <p>Finished water storage facilities must have an overflow pipe (WAC 246-290-235). Consult with DOH on how to provide your storage tank protection from overfilling.</p>

Item 77	Does the overflow line discharge near ground level?
Guidance	The overflow should discharge within 24 inches of the ground surface. This makes the overflow visible to the operator while providing for controlled “splash” and energy dissipation (to avoid erosion).
How to mark the checklist	Mark as “Yes” if the overflow line discharges near the ground.
Classification	Recommendation if marked “No.”
WAC reference	
Publications	
Webpage(s)	
Standard language	We recommend that the overflow discharge about 24 inches above grade. A splash plate and drainage structure should prevent erosion and damage of public or private property.
Other notes for the sanitary surveyor	<p>Record any highly unusual feature of the overflow in the comment section of Part I on the checklist, and take photographs.</p> <p>Reservoir overflow lines should discharge in a location where the operator can inspect the outlet on a routine basis.</p>

Item 78	Is the overflow-line discharge area protected from potential erosion?
Guidance	Prolonged overflow discharge (imagine failure of the pump control system) could create erosion in all but the most reinforced soils. We are particularly concerned with the potential to erode any part of the reservoir foundation or other critical water system structure.
How to mark the checklist	Mark as “No” if you believe a prolonged overflow event will likely cause erosion that threatens water system infrastructure or private property.
Classification	Recommendation if marked “No.” (If the potential for erosion due to a prolonged overflow event threatens the reservoir foundation, it is a significant finding).
WAC reference	
Publications	
Webpage(s)	
Standard language	We recommend you construct an energy dissipation structure and a defined course for water to flow or accumulate (a retention pond) to prevent erosion and damage to property.
Other notes for the sanitary surveyor	

Item 79 and 79a	Does the overflow line discharge into a storm drain or surface water? If yes, is there an air gap at the discharge of the overflow OR does the overflow drop at least 34 vertical feet measured from the overflow connection down to the receiving water body?
Guidance	<p>The overflow should be constructed so that an operator can see that an overflow is occurring and take steps to stop it. There should be an air gap between the overflow pipe outlet and the receiving structure. To protect the water in the reservoir from contamination, direct insertion of the end of an overflow pipe into a nonpotable substance constitutes a potential cross-connection hazard.</p> <p>It's important to establish the 34-foot vertical difference. If there is at least 34 vertical feet between the overflow tank connection and the maximum water level in the overflow receiving structure, it's impossible to backsiphon anything into the drinking water supply.</p>
How to mark the checklist	<p>If the answer to Item 79 is "No," skip Item 79a.</p> <p>Mark Item 79a as "Yes" if there is a 2-pipe diameter air gap between the end of the overflow pipe and the top of the catch basin, OR the overflow discharges to a drainage swale constructed in a way that will not submerge the end of the overflow pipe into the water in the swale.</p> <p>OR</p> <p>Mark Item 79a as "Yes" if you believe the difference in height between the overflow connection at the tank and the maximum water level in the overflow receiving structure is at least 34 feet.</p> <p>If unknown, mark Item 79 "unk" and refer to Item 70.</p>
Classification	Significant deficiency if Item 79 is marked "Yes" and Item 79a is marked "No."
WAC reference	<p>WAC 246-290-235</p> <p>WAC 246-290-415 (5)</p>
Publications	
Webpage(s)	
Standard language	Create a minimum 2-pipe diameter air gap between the end of the overflow pipe and the high water level of the receiving structure.
Other notes for the sanitary surveyor	<p>Most reservoirs have vents that should keep negative internal pressure from developing when demand draws water out of the reservoir. However, if the vent clogs it is possible to develop a partial negative pressure inside the reservoir while the water system draws water from the reservoir (this is an extremely rare event).</p> <p>Surveyors may observe the overflow discharge into a catch basin or manhole located near the base of the tank. This may be the beginning of a dedicated drainage system for the overflow, and not part of the municipal storm drainage system. Ask the operator where the pipe leaving the catch basin or manhole goes. If the overflow discharges into a dedicated drain, then the risk of blockage in the drain is very low. If there is at least a 34-foot vertical difference between the overflow connection to the tank and the maximum water level in the system of catch basins and drain pipes comprising the overflow receiving structure, then it's impossible to back siphon anything into the drinking water supply.</p>

Item 80	Does the overflow line discharge directly into a sanitary sewer?
Guidance	The surveyor should determine whether the end of the overflow connects directly to a sanitary sewer (this would be extremely unusual).
How to mark the checklist	Mark as “Yes” if the overflow discharges directly to a sanitary sewer or into a sanitary sewer manhole.
Classification	Significant deficiency if marked “Yes.” If unknown, mark Item 80 “unk” and refer to Item 70.
WAC reference	WAC 246-290-235 WAC 246-290-415 (5)
Publications	
Webpage(s)	
Standard language	Create an air gap of at least 2 pipe diameters between the end of the overflow pipe and the sanitary sewer.
Other notes for the sanitary surveyor	<p>A direct connection from the end of the overflow pipe to a sanitary sewer may create a chimney effect, which pulls sewer gasses through the overflow into the reservoir and poses a cross-connection threat. A direct sewer connection is unacceptable, regardless of the vertical distance the overflow pipe drops.</p> <p>There is also a risk backsiphonage similar to the cross-connection risk under Item 79.</p>

Item 81	Can the reservoir be isolated from the rest of the water system and be drained through a dedicated drain line?
Guidance	<p>To drain a reservoir for maintenance and inspection, the operator must first close the valve that supplies water into the reservoir and then open the drain valve to let the water out. The drain usually connects with the buried section of the overflow.</p> <p>If the drain has an outlet separate from the overflow, the valve controlling the drain remains closed while the tank is in operation. Therefore, a drain outlet (when separate from an overflow outlet) does not need protection to keep contaminants from entering the water supply.</p>
How to mark the checklist	Mark as “No” if the reservoir cannot be isolated from the distribution system, OR there isn’t a way to drain the reservoir without introducing the contents of the reservoir into the distribution system. Note which provision (isolation or drain, or both) is missing in the comment section of Part I on the checklist.
Classification	Recommendation if marked “No.”
WAC reference	WAC 246-290-415 Operations and Maintenance
Publications	
Webpage(s)	
Standard language	<p>Missing or inoperable tank isolation valve(s)</p> <p>We recommend installing (or replacing, if the existing valve is inoperable) an isolation valve on the fill or draw line(s) into the storage tank during the next scheduled shutdown of the water system. This will enable you to isolate the reservoir from the distribution system if you need to repair or maintain the tank, without necessarily shutting down the water system and interrupting water service.</p> <p>No means to drain the reservoir by gravity</p> <p>We recommend installing the means by which you can empty the reservoir without introducing the contents of the reservoir into the distribution system. This will facilitate your ability to respond quickly to a reservoir water quality or structural problem.</p>
Other notes for the sanitary surveyor	<p>If the reservoir is the only one serving a particular area, and the reservoir normally operates by gravity, then closing the reservoir isolation valve may cause a destructive vacuum to form in the pipeline on the distribution system-side of the reservoir isolation valve. There should be an air-vacuum relief valve located on the distribution system side of the reservoir isolation valve. It will allow air to enter the distribution system and relieve a vacuum formed when an unmet water demand is exerted on the distribution system.</p> <p>Many reservoirs have combined overflow and drain lines. This arrangement is allowed as long as it meets the requirements for both functions.</p> <p>Pumps may be used to empty a storage tank that has no gravity drain.</p>

Item 82	When was the tank inspected last?
Guidance	This is not a question about when the operator last looked inside the reservoir. A qualified tank inspector or contractor must periodically inspect the structural integrity of above-grade steel and below-grade concrete reservoirs.
How to mark the checklist	Mark this item with the date (year) when a qualified tank inspector or contractor last inspected the reservoir. If the operator doesn't know the exact year of the last inspection, ask for an approximate timeframe.
Classification	Recommendation if it's been more than 5 years since a qualified tank inspector or contractor inspected the interior of the storage tank.
WAC reference	
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p> <p><i>Noncommunity Small Water System Management Program Guide</i> (331-474) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-474.pdf</p> <p>For community systems: <i>Small Water System Management Program Guide</i> (331-134) http://www.doh.wa.gov/portals/1/Documents/pubs/331-134.doc</p>
Webpage(s)	
Standard language	<p>If the interior of the storage tank hasn't been inspected in over 5 years:</p> <p>We recommend contracting the services of an experienced storage tank service and inspection contractor to perform an in-service cleaning and inspection of your storage tank.</p>
Other notes for the sanitary surveyor	<p>Operators or owners should get a comprehensive inspection of the interior whenever they drain the tank for cleaning. Industry standards recommend a comprehensive tank inspection—inside and out—every five years, except for newly constructed tanks. Purveyors should inspect a new tank within 10 years of service and every 5 years thereafter.</p> <p>Services are available to clean and inspect reservoirs without draining the stored water. It is possible for several small water systems to schedule tank maintenance at the same general time potentially at lower cost.</p> <p>You should check the pre-survey data reports to see if there are elevated iron and manganese residuals in the source water that may build up sediments in the reservoir. Operators should know how frequently the rules require them to have the reservoir inspected.</p>

Item 83	What is the tank cleaning frequency?
Guidance	This question refers to the purveyor's reservoir operations plan, which should describe the frequency the reservoir is cleaned. Inspections are probably on the same schedule. Specialized contractors routinely clean and inspect a reservoir while the tank is in service.
How to mark the checklist	Mark this item with the date when (year) a qualified tank cleaner or contractor last cleaned the tank. If the operator doesn't know the exact year of the last cleaning, ask for an approximate timeframe.
Classification	Recommendation if it's been more than 5 years a qualified tank cleaner or contractor last cleaned the interior of the storage tank.
WAC reference	WAC 246-290-415 Operations and Maintenance
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	If the interior of the storage tank hasn't been cleaned in over 5 years: We recommend contracting the services of an experienced storage tank service and inspection contractor to perform an in-service cleaning and inspection of your storage tank.
Other notes for the sanitary surveyor	For a list of qualified contractors who can clean and inspect a reservoir interior while the reservoir remains in service, query local information sources under terms such as "potable water tank cleaning services." Services are available to clean and inspect reservoirs without the need to drain the stored water. It is possible for several small water systems to schedule tank maintenance at the same general time potentially at lower cost. You should check the pre-survey data reports to see if there are elevated iron and manganese residuals in the source water that may build up sediments in the reservoir. Operators should know how frequently the rules require them to have the reservoir inspected.

Item 84	Does tank size, operation, and internal piping configuration appear to provide adequate water turnover?
Guidance	<p>The surveyor may not be able to determine the answer to this question (that's okay).</p> <p>Good water turnover means the reservoir can mix existing stored water with new incoming water, based on its geometry, volume, operation (how much water is allowed to flow out of the reservoir before the reservoir is refilled), and the rate of flow in and out. Mixing is important because it prevents pockets of "old" water at risk of degraded quality.</p>
How to mark the checklist	<p>Mark as "Yes" if the operator tells you there is a separate inlet and outlet, and the discharge end of the inlet pipe (flow into the reservoir) is located above the outlet pipe.</p> <p>Mark as "No" if you determine the reservoir is large in proportion to the average daily demand of the water system and there is a single inlet-outlet pipe. A reservoir is large in proportion to demand if it holds more than 7 times the average daily demand.</p> <p>Otherwise, the surveyor should mark this item as "unknown" (unk).</p>
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-235(1)(b)
Publications	
Webpage(s)	
Standard language	We recommend you seek the services of a licensed professional engineer to determine the best way to reduce the residence time in your reservoir. Long residence time may degrade water quality, and lead to water quality problems in the distribution system and complaints from your customers.
Other notes for the sanitary surveyor	<p>Maintaining free chlorine residual in the reservoir provides some protection against degraded water quality.</p> <p>Allowing the reservoir level to drop more before starting the supply pump(s) will "turn over" the reservoir more effectively. Expanding the range of the "pump on – pump off" level settings during periods of low demand (such as winter) also may discourage ice formation.</p>

Item 85	Does the tank show signs of excessive leakage, significant structural cracking, or advanced concrete spalling so that a structural assessment is needed?
Guidance	We are particularly interested in reservoirs with flat roofs, or concrete reservoirs with concrete cold-joints between the sidewalls and roof. Cracks, spalling and poor initial construction of the roof or sidewalls may provide pathways for contaminants to enter the drinking water supply and weaken the structure.
How to mark the checklist	<p>Mark as “Yes” if you believe cracks, spalling, or visible leaks pose a structural hazard, which could lead to a sanitary hazard (opportunities for contaminants to enter the reservoir) or progressive structural failure leading to the loss of use of the reservoir.</p> <p>Mark as “No” for concrete reservoirs that weep very small amounts of water through sidewall construction joints (the reservoirs that look like large concrete silos commonly exhibit this).</p>
Classification	Significant finding if marked “Yes.”
WAC reference	<p>WAC 246-290-235</p> <p>WAC 246-290-415 (5)</p>
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351)</p> <p>http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p>
Webpage(s)	
Standard language	Secure the services of a qualified structural inspector, and send DOH a copy of the scope of work and a schedule detailing the inspection of the structure and recommended repairs.
Other notes for the sanitary surveyor	<p>Concrete spalling is the progressive loss of concrete back to its constituent parts (aggregate stone and sand). Spalling is caused by:</p> <ul style="list-style-type: none"> • Poor initial formulation or curing of the concrete (too much water). • Freeze-thaw cycle fatigue. Each cycle creates micro-cracks that expand and remove the protective finish on the concrete surface. • Acidic pitting and weakening of the concrete surface due to rainfall. <p>You should note cracks and leakage you can see or hear and photograph, if possible). Wood stave tanks are at high risk for leaks.</p>

Checklist Part J: Distribution System

The distribution system is made up of pipes, valves, blow-offs, hydrants, sampling stations, booster pump stations, and storage tanks.

However, our checklist focuses on the piping system and the components of the system that convey water from the source to the consumer. This network of pipes is buried in the ground, so it's not subject to physical damage, tampering, or freezing. Surveyors should not be surprised to learn that purveyors don't know exactly where some or all of this piping is, how old it is, or what it's made of.

For most communities, the distribution system is the most expensive infrastructure a purveyor owns. For most water systems, reconstructing the distribution system is more expensive than the cost to replace the storage tank, well, and well house. Since the cost to replace water mains is so high, financial planning and prioritization is critical if a purveyor intends to keep every customer reliably supplied with safe drinking water.

Low pressure, high distribution system leakage rates, discolored water and frequent water main breaks are signs that this expensive infrastructure has reached the end of its useful life, and realistic plans for its replacement must be developed and implemented.

Topics to describe in the comments section of Part J:

Describe and evaluate the distribution system including maintenance, and operational, sanitary and security observations.

Item 86	Is a complete, up to date, and accurate map of the distribution system maintained?
Guidance	An ideal map (along with any other supporting documents or records) displays the size and material of water mains; shows location of distribution system appurtenances such as main line valves, hydrants, blow-offs; the location, size, and capacity of reservoirs and booster pump stations; and the location and capacity of wells, interties, and other supply sources.
How to mark the checklist	Mark as “Yes” if the purveyor maintains a current map of the distribution system showing the size and location of water mains, main line valves, blow-offs, and hydrants.
Classification	Recommendation if marked “No.”
WAC reference	
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	We recommend investing the resources necessary to create a map that displays the size and material of water mains. It should show the location of distribution system appurtenances, such as main line valves, hydrants, blow-offs; the location, size, and capacity of reservoirs and booster pump stations; and the location and capacity of wells, interties, and other sources of supply.
Other notes for the sanitary surveyor	<p>A great map (including any other supporting documents or records) includes the above information plus the age of the pipeline segments; the maintenance history (date and location of major leaks repaired); and location information on service connections.</p> <p>If an operator claims that all this information is in his or her head, and it’s not documented in writing and available to the governing board, is a giant RED FLAG. You should make a note of this fact on the checklist. DOH will follow-up with the purveyor.</p>

Item 87	Does the system provide adequate pressure throughout the distribution system?
Guidance	Adequate pressure is no less than 20 psi at each service connection during periods of peak demand, and positive pressure throughout the system during fire flow events. An at-risk setting is a development of homes built near the base of a reservoir.
How to mark the checklist	Mark as “No” if the operator reports that sections of the distribution system operate with less than 20 psi during periods of peak demand.
Classification	If marked “No,” this will be referred to the regional engineer for follow-up.
WAC reference	WAC 246-290-230 WAC 246-290-420
Publications	
Webpage(s)	
Standard language	The low-pressure condition in a portion of your distribution system has been referred to DOH for further follow-up.
Other notes for the sanitary surveyor	<p>If the operator admits there are connections served without a minimum of 20 psi during periods of peak demand, you should make a note of this in the comments section of Part J on the checklist. DOH will follow-up with the purveyor.</p> <p>Also, note whether such connections operate with individual service line booster pumps, and if so, note who owns and operates those booster pumps.</p> <p>Observe the placement of homes served by gravity from a nearby reservoir. If a home is less than 50 feet below the low operating level of the reservoir, the distribution system serves that home with less than 20 psi.</p>

Item 88	Are proper procedures followed for disinfection of new construction or repairs?
Guidance	Improper or no disinfection practiced after new construction or repairs poses a significant risk to consumers. We want you to determine whether the operator knows what he or she must do before restoring normal water service following work on the water distribution system.
How to mark the checklist	Mark as “Yes” if the operator is aware of, and follows industry standards for disinfecting the distribution system after repairs or new construction.
Classification	Observation if marked “No.”
WAC reference	WAC 246-451 (1) and (2)
Publications	<p><i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf</p> <p>WASHDOT’s <i>Standard Specifications for Road, Bridge, and Municipal Construction</i> (M 41-10) http://www.wsdot.wa.gov/publications/manuals/fulltext/m41-10/ss2010.pdf</p>
Webpage(s)	
Standard language	Operators must follow drinking water industry standards for disinfection following repair of existing water mains or installation of new mains (WAC 246-290-451). Refer to Section 7.09 of the APWA/WASHDOT Standard Specifications ¹⁵ .
Other notes for the sanitary surveyor	<p>Operators should disinfect new and repaired pipelines according to established standards such as those from the Washington State Department of Transportation (WSDOT)/APWA Section or AWWA C-651. Basic water main disinfection procedures follow a particular sequence:</p> <ol style="list-style-type: none"> Prevent entry of contaminants during storage and construction. After installation, flush (2.5 fps). Chlorinate by dosing water flowing into new section of main at a rate of 50 ppm of free chlorine. At end of 24-hours, water in all section of new main should have at least 25 ppm of free chlorine (WSDOT/APWA Standard). Flush again until chlorine is completely gone. Dispose of chlorinated water in an environmentally safe manner. Protect against backflow during pressure test and disinfection. Collect coliform samples. Activate water main after coliform samples are reported satisfactory. <p>To disinfect pipeline properly, the operator must have access to a free chlorine field test kit.</p>

¹⁵ <http://www.wsdot.wa.gov/publications/manuals/fulltext/m41-10/ss2010.pdf>

Item 89	Are there blow-offs to flush the system?
Guidance	Blow-offs enable the operator to flush the distribution system. Water main flushing is the process of cleaning or "scouring" the interior of water distribution mains by deliberately directing water through the mains to a discharge point (blow-off). Flushing helps to maintain water quality (see Item 90), is integral to the maintenance of water mains (see Item 88), and helps an operator respond effectively to an emergency where it's important to get the existing water out of the distribution system as quickly as possible.
How to mark the checklist	Mark as "Yes" if you believe the distribution system is equipped with the means to flush water out of the system main(s) at the rate of at least 2.5 feet per second.
Classification	Recommendation if marked "No."
WAC reference	
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	We recommend you install facilities that permit flushing the distribution system. Flushing helps maintain water quality, is integral to the maintenance of water mains, and helps an operator effective respond to an emergency where it's important to get the existing water out of the distribution system as quickly as possible.
Other notes for the sanitary surveyor	<p>While flushing, the water should move at least 2.5 feet per second. This means that the blow-off at the end of a water main must have enough capacity to discharge the flow needed to create this velocity. A 4-inch pipe flowing at 2.5 fps requires 100 gpm; a 6-inch pipe requires 220 gpm.</p> <p>We do not recommend flushing through consumer service lines because what is flushed from the water main might get stuck somewhere in the consumer's plumbing. Moreover, a group of homes located at the end of a pipeline that open their hose spigots all at once can only effectively "flush" a water main of about 2 inches in size.</p> <p>The challenge most small systems will have in periodically flushing is related to the infrastructure:</p> <ul style="list-style-type: none"> • Are there blow-offs capable of discharging enough water to generate a flushing velocity in the water mains? • Are distribution system valves located so the operator can deliberately direct flushing through the water mains toward a designated discharge blow-off? • Does the water system,(wells, reservoirs, booster pump stations) have the capacity to generate sufficient flow to flush the water mains?

Item 90	Does the purveyor seasonally or annually flush the distribution system?
Guidance	In most water systems, small particulate matter settles in the distribution system's "quiet" locations, such as dead ends. It's important to get this settled material out, or else it will someday affect water quality and consumer acceptance.
How to mark the checklist	Mark as "Yes" if the purveyor flushes the distribution system at least once a year.
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-415
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	We recommend you flush your distribution system at least once a year. It's important to get settled material out of the pipes, or else it will someday affect water quality and consumer acceptance. If you have elevated iron and manganese or sediment problems, you may need to perform flushing more frequently.
Other notes for the sanitary surveyor	Systems with elevated iron and manganese (Fe/Mn) need to flush routinely to reduce the amount of sediment build-up that leads to discolored water, possible taste and odor problems. The pre-survey report includes source inorganic chemical test results that show Fe/Mn levels. Customer complaints may indicate a problem. You should find out whether flushing is possible using blow-off assemblies or fire hydrants.

Item 91	Does the purveyor exercise its distribution system valves?
Guidance	Valves must be exercised periodically (opened and closed) or they won't work when they're needed. By simply cycling the valve position fully (from open to close to open, or vice versa), the operator will reduce the need for valve maintenance and repair, and greatly improve the chances that the valve will work on demand.
How to mark the checklist	Mark as "Yes" if the purveyor exercises the mainline valves at least once a year.
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-415(3) Operations and Maintenance
Publications	<i>Preventive maintenance program: Guide for small public water systems using groundwater</i> (331-351) http://www.doh.wa.gov/portals/1/documents/pubs/331-351.pdf
Webpage(s)	
Standard language	We recommend you exercise (turn fully closed then back to fully open) your distribution system valves at least once each year. Valves must be exercised periodically (opened and closed) or they won't work when they're needed. By simply cycling the valve position (from open to close to open again, or vice versa), you will reduce the frequency of valve maintenance and repair, and greatly improve the chances that the valve will work on demand.
Other notes for the sanitary surveyor	

Checklist Part K: Cross-connection Control

A **cross connection** is any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable liquid, solid, or gas that could contaminate the potable water supply by backflow. Cross connections exist in all plumbing systems. Cross connections may also exist in the purveyor's water system facilities. There are numerous well-documented cases where unprotected cross connections contaminated drinking water. These cases have caused illness, injury, and in some cases, death, to consumers served by the system.

The task of eliminating all cross connections is enormous. However, all purveyors can implement CCC programs that reasonably reduce the risk of contamination to their systems. For a drinking water (potable water) supply to become contaminated via a cross connection, three things need to happen *simultaneously*:

1. The potable water supply piping must be unprotected (or improperly protected) from a cross connection.
2. A physical cross connection must be made between the potable water supply piping and a contaminant source.
3. Backflow conditions must occur.

Backflow is the flow of water (or other solid, liquid, or gas from any source) back into the potable water supply. Backflow may be due to either:

- Backsiphonage
- Backpressure

Backsiphonage is backflow caused by a negative pressure (vacuum or partial vacuum) in the supply piping. Backsiphonage occurs when system pressure is reduced below atmospheric pressure. The effect is similar to sipping water through a straw.

The following scenario illustrates how backsiphonage backflow conditions could occur in a public water system:

- A public water system shuts off a main to repair a leak. The water main is at the base of a hill.
- The water main is at a lower elevation than the homes on the hill. This creates a situation where water in the plumbing in the homes on the hill can drain into the public water system main.
- When a customer at the bottom of the hill uses water, it creates a siphon at households at the top of the hill and water drains out of their plumbing systems.
- At one household at the top of the hill, a garden hose is being used to fill a child's wading pool. The hose is submerged in the pool.
- When the backflow conditions occur, the nonpotable water from the wading pool is siphoned through the cross connection (submerged hose) into the household plumbing and then into the water main.
- The water from the wading pool contaminates the water main.
- When water service is restored, contaminated water is delivered to customers served by the public water system.

Backpressure is backflow caused when pressure in the customer's plumbing is greater than the pressure in the water supply piping. The higher pressure in the customer's plumbing may be from a booster pump, heating boiler, and so on.

The following scenario illustrates how **backpressure backflow** could occur in a water system:

- The fire department withdraws water from a hydrant. This reduces the pressure in the public water system main from 50 pounds per square inch (psi) to 20 psi.
- A customer served by the public water system installed a lawn irrigation system. The customer's irrigation system is supplied with water from a pond. The pump supplying the irrigation system operates at 30 psi. To ensure a supply for the irrigation system when the pond is dry, the customer installed a standby connection to the household plumbing (potable water piping).
- On the day of the fire flow situation, the normally closed valve between the household plumbing and irrigation piping is accidentally left open.
- Backflow wouldn't normally occur at this customer's connection, because the pressure in the public water system is greater than the pressure supplied by the irrigation pump.
- However, during the fire flow situation, the pressure from the irrigation pump is greater than the pressure in the water main. Water from the pond is pumped into the household plumbing, and then into the public water system main.
- When the fire flow ends, pressure in the public water system water main increases, and contaminated water is delivered to customers served by the system.

Item 92	Does the water system serve a single connection?
Guidance	A single connection water system serves one building. Advise the purveyor that he or she has certain legal responsibilities under the Uniform Plumbing Code for the control of cross connections within that building.
How to mark the checklist	Mark as “Yes” if the water system serves a single building.
Classification	Informational
WAC reference	
Publications	
Webpage(s)	
Standard language	
Other notes for the sanitary surveyor	<p>There is no premises isolation requirement under WAC 246-290-490 for a water system that serves a single building.</p> <p>If the single building is a restaurant, convenience store, or other commercial use with a carbonated beverage dispenser, remind the owner that she or he is responsible under the Uniform Plumbing Code (and locally adopted codes) to ensure installation of the appropriate cross-connection control assembly between the carbon dioxide injection point and the rest of the plumbing in the building.</p>

Item 93	Is the water system known to serve one or more high health hazard premises, such as those listed in Table 9 in WAC 246-290-490?
Guidance	This question requires knowledge of the types of high health hazard premises listed in Table 9 (see Page 149).
How to mark the checklist	Mark as “Yes” if the water system serves one or more customers described on Table 9 (see Page 149). Then record which of these types of premises the water system serves in the comments section to checklist Part K. Refer to these notes as you respond in writing to checklist Item 95 and Item 96.
Classification	Informational
WAC reference	WAC 246-290-490
Publications	<i>Cross Connection Control for Small Water Systems</i> (331-234) http://www.doh.wa.gov/portals/1/documents/pubs/331-234.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention.aspx Approved backflow assembly list can be viewed at http://www.usc.edu/dept/fccchr/list.html A list of certified backflow assembly testers can be viewed at http://www.instruction.greenriver.edu/wacertservices/bat/bat_publiclist.asp A list of certified cross-connection control specialists can be viewed at http://www.backflowgroup.org/resources/CCSListPub2006-09-28.pdf
Standard language	

<p>Other notes for the sanitary surveyor</p>	<p>Table 9 lists high health hazard premises requiring premises isolation (WAC 246-290-490 (4)).</p> <p>SEVERE* AND HIGH HEALTH CROSS-CONNECTION HAZARD PREMISES REQUIRING PREMISES ISOLATION BY AIRE GAP OR REDUCED PRESSURE BACKFLOW ASSEMBLY</p> <p>Agricultural (farms and dairies)</p> <p>Beverage bottling plants</p> <p>Car washes</p> <p>Chemical plants</p> <p>Commercial laundries and dry cleaners</p> <p>Premises where both reclaimed water and potable water are provided</p> <p>Film processing facilities</p> <p>Food processing plants</p> <p>Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers</p> <p>Premises with separate irrigation systems using the purveyor's water supply and with chemical addition+</p> <p>Laboratories</p> <p>Metal plating industries</p> <p>Mortuaries</p> <p>Petroleum processing or storage plants</p> <p>Piers and docks</p> <p>Radioactive material processing plants or nuclear reactors*</p> <p>Survey access denied or restricted</p> <p>Wastewater lift stations and pumping stations</p> <p>Wastewater treatment plants*</p> <p>Premises with an unapproved auxiliary water supply interconnected with the potable water supply</p> <hr/> <p>+ For example, parks, playgrounds, golf courses, cemeteries, estates, etc.</p> <p>* RPBA's for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, the purveyor shall require an approved air gap at the service connection.</p>
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Item 94	Has the purveyor established the legal authority to implement a CCC program (formally adopted an ordinance, resolution, by-laws, or other document defining the purveyor's CCC program requirements, and empowering the purveyor to enforce them)?
Guidance	The first step in developing a cross-connection control program is a locally adopted ordinance or by-law that defines the scope of the purveyor's and customers' responsibility.
How to mark the checklist	Mark as "Yes" if the purveyor shows you a copy of their local ordinance or by-law enabling implementation of a cross-connection control program.
Classification	Observation if marked "No."
WAC reference	WAC 246-290-490
Publications	<i>Cross Connection Control for Small Water Systems</i> (331-234) http://www.doh.wa.gov/portals/1/documents/pubs/331-234.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention.aspx "Approved backflow assembly list" at http://www.usc.edu/dept/fccchr/list.html "List of certified backflow assembly testers" at http://www.instruction.greenriver.edu/wacertservices/bat/bat_publiclist.asp "List of certified cross-connection control specialists" at http://www.backflowgroup.org/resources/CCSListPub2006-09-28.pdf
Standard language	Unless you own all the premises your water system serves, you must establish the legal authority to implement an effective cross-connection control program (WAC 246-290-490). The first step in developing an effective cross-connection control program is to develop the legal authority to implement your CCC program. Refer to <i>Cross Connection Control for Small Water Systems</i> (331-234) or a certified cross-connection control specialist for guidance in establishing your authority. There is a list of certified cross-connection control specialists ¹⁶ on the DOH website.
Other notes for the sanitary surveyor	

¹⁶ <http://www.backflowgroup.org/resources/CCSListPub2006-09-28.pdf>

Item 95, 95a, and 95b	<p>Has the purveyor designated a cross-connection control specialist (CCS) to be in responsible charge of the cross-connection control program?</p> <p>If yes, has the CCS conducted a hazard evaluation to identify high health hazard premises?</p> <p>If yes, has the purveyor completed installation of a backflow prevention assembly on the service line to each identified high health hazard premise?</p>
Guidance	<p>The second step in developing a cross-connection control program is hiring a certified cross-connection control specialist, and completing a hazard survey.</p> <p>Only a cross-connection control specialist can make the call on whether a connection (“premises”) is a high health hazard and, if it is, decide how to best control or eliminate the cross-connection hazard.</p> <p>A partial list of high health hazard premises is in WAC 246-290-490 at http://apps.leg.wa.gov/wac/default.aspx?cite=246-290-490 (see Table 9).</p>
How to mark the checklist	<p>Mark Item 95 as “Yes” if the purveyor has employed a certified cross-connection control specialist.</p> <p>Mark Item 95a as “Yes” if the CCS already conducted a hazard assessment of all the purveyor’s service connections.</p> <p>Mark Item 95b as “Yes” if the purveyor met the premise isolation requirement for each identified high health hazard premise by installing the required premises isolation assembly on the service line.</p> <p>Mark Item 95b as “N/A” if the CCS identified no high health hazards.</p>
Classification	Observation if any answer is marked “No.”
WAC reference	WAC 246-290-490
Publications	<p><i>Cross Connection Control for Small Water Systems</i> (331-234) http://www.doh.wa.gov/portals/1/documents/pubs/331-234.pdf</p>
Webpage(s)	<p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention.aspx</p> <p>“Approved backflow assembly list” at http://www.usc.edu/dept/fccchr/list.html</p> <p>“List of certified backflow assembly testers” at http://www.instruction.greenriver.edu/wacertservices/bat/bat_publiclist.asp</p> <p>“List of certified cross-connection control specialists” at http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention/CCSPublicList.aspx</p>
Standard language	<p>If the purveyor hasn’t employed a CCS use paragraphs 1-4.</p> <p>If the CCS hasn’t conducted a hazard evaluation yet use paragraphs 4-5.</p> <p>If the purveyor hasn’t finished installing a backflow prevention assembly on the service line to each identified high health hazard premise use paragraph 5.</p> <ol style="list-style-type: none"> 1. You must employ a certified cross-connection control specialist (CCS) to develop and implement your cross-connection control (CCC) program (WAC 246-290-490). Implementation includes assessing the degree of hazard for each service connection the water system serves. The CCS must identify high health hazards and ensure that the appropriate cross-connection control assembly is installed on the service line to

	<p>each high health hazard premise.</p> <ol style="list-style-type: none"> 2. DOH considers it a high priority for all purveyors to control or eliminate any cross-connection hazard presented by high health hazard premises. A partial list of such premises is in Table 9 of WAC 246-290-490. 3. Begin by hiring a CCS. You can view a list of certified cross-connection control specialists at http://www.backflowgroup.org/resources/CCSListPub2006-09-28.pdf 4. Direct your cross-connection control specialist to conduct a hazard assessment of all service connections. The authority for this must be in your locally adopted CCC ordinance or by-law. 5. Under the direction of your CCS, ensure that the appropriate cross-connection control device is installed on the service line of each high health hazard premises.
Other notes for the sanitary surveyor	

Item 96	Has each testable backflow prevention assembly installed for premises isolation been tested by a DOH certified backflow assembly tester (BAT) within the past 12 months?
Guidance	The third and final step in implementing an effective CCC program is to ensure that a BAT tests each assembly once a year. The purveyor's communication with consumers, and ability to maintain accurate records are important to successfully implementing this step.
How to mark the checklist	<p>Mark as "Yes" if the appropriate cross-connection control assembly is in place at each high health hazard premise and the assembly was tested within the last 12 months.</p> <p>If the purveyor states the assemblies were tested but he or she can't prove it by showing you test reports completed by a certified backflow assembly tester, then mark the item "No" and place a comment explaining your answer in the space below.</p> <p>Mark as "N/A" if Item 95b is marked "N/A."</p>
Classification	Observation if marked "No."
WAC reference	<p>WAC 246-290-415 (5)</p> <p>WAC 246-290-490</p>
Publications	<p><i>Cross Connection Control for Small Water Systems</i> (331-234)</p> <p>http://www.doh.wa.gov/portals/1/documents/pubs/331-234.pdf</p>
Webpage(s)	<p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention.aspx</p> <p>"Approved backflow assembly list" at http://www.usc.edu/dept/fccchr/list.html</p> <p>"List of certified backflow assembly testers" at http://www.instruction.greenriver.edu/wacertservices/bat/bat_publiclist.asp</p> <p>"List of certified cross-connection control specialists" at http://www.backflowgroup.org/resources/CCSListPub2006-09-28.pdf</p>
Standard language	<p>You must develop and implement an effective cross-connection control program (WAC 246-290-490). DOH considers it a high priority for all purveyors to control or eliminate any cross-connection hazard presented by high health hazard premises such as (list the premises type present at the system here).</p> <p>A certified backflow assembly tester must test backflow assemblies at least every 12 months. A list of BATs is on our cross-connection control webpage.</p> <p>Visit DOH's cross-connection control webpage at http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention.aspx for resources and guidance. Contact DOH if you have questions about the steps you must take to comply with WAC 246-290-490.</p>
Other notes for the sanitary surveyor	

Item 97	Did you observe the end of a hose connected to the potable water system submerged in a pool, hot tub, watering trough or other nonpotable body of water during the survey?
Guidance	We don't expect you to search for such circumstances. However, if you see a submerged hose while conducting the field survey, you should mark it on the checklist. The operator should eliminate this type of cross connection by pulling the hose out of the water before the end of the survey. Then, record the issue as resolved on the checklist.
How to mark the checklist	Mark as "Yes" if you observe an active, unprotected cross connection, such as the end of a hose submerged in a pool, hot tub, animal water trough, or other nonpotable body of water.
Classification	Significant deficiency if marked "Yes."
WAC reference	WAC 246-290-415 (5) WAC 246-290-490
Publications	
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention.aspx
Standard language	If the purveyor cannot eliminate the cross connection during the survey: Immediately eliminate the cross connection observed at _____ by creating an air gap (at least two times the pipe diameter), or terminate water service to the customer until a DOH-certified cross-connection control specialist conducts an inspection, recommends the appropriate cross-connection control device, and a DOH-certified backflow assembly tester installs and tests the device.
Other notes for the sanitary surveyor	If you observe an active, unprotected cross connection, ask the operator to take steps needed to eliminate the cross connection during the survey. If the cross connection is eliminated, then note this fact in the comments section of Part K, and do not include it in the cover letter as a significant deficiency. Instead, mention the resolution in the narrative portion of the sanitary survey cover letter.

Item 98	<p><u>This question only applies to a facility operating a sewage dump station.</u></p> <p>Is there a sewage dump station without a reduced pressure backflow assembly on the water supply line?</p>
Guidance	This question only applies to parks that are public water systems. We don't expect you to inquire about dump stations operated within a park that is a customer of a larger water system.
How to mark the checklist	<p>Mark as "Yes" if there is a sewage dump station and there is no reduced pressure backflow assembly on the water supply at the dump station.</p> <p>Mark as "No" if there is a sewage dump station and there is a reduced pressure backflow assembly in place on the water supply at the dump station.</p> <p>Mark as "N/A" if there is no dump station, or if there is a dump station but there is no water supply available there (this would rarely occur).</p>
Classification	Significant deficiency if marked "Yes."
WAC reference	<p>WAC 246-290-415(5)</p> <p>WAC 246-290-490</p>
Publications	
Webpage(s)	<p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/CrossConnectionControlBackflowPrevention.aspx</p> <p>"Approved backflow assembly list" at http://www.usc.edu/dept/fccchr/list.html</p> <p>"List of certified backflow assembly testers" at http://www.instruction.greenriver.edu/wacertservices/bat/bat_publiclist.asp</p> <p>"List of certified cross-connection control specialists" at http://www.backflowgroup.org/resources/CCSListPub2006-09-28.pdf</p>
Standard language	Secure the services of a certified cross-connection control specialist to identify the appropriate way to eliminate or control the cross-connection hazard, purchase the appropriate assembly, and have a certified backflow assembly tester install and test the assembly.
Other notes for the sanitary surveyor	Record whether the reduced pressure backflow assembly (RPBA) is installed vertically or horizontally, record the manufacturer and model number, and inquire about the last test date and test result. We will confirm that the RPBA is on the approved list of assemblies and approved for the vertical or horizontal installation.

Checklist Part L – Operator

All community, nontransient noncommunity, and some transient noncommunity systems must employ a certified operator to carry out various operational functions. To become certified, operators must meet minimum education and experience requirements and pass an exam. In addition, certified operators must meet a professional growth requirement every three years to maintain their certification status.

Item 99	Is the water system operator certified?
Guidance	All community and nontransient noncommunity water system must employ a certified operator.
How to mark the checklist	Mark as “Yes” if the purveyor currently employs a certified operator.
Classification	Informational Record in the comments section of Part L of the checklist if the operator of record is no longer employed, and the purveyor hasn’t hired a replacement certified operator. We will refer the issue to our Operator Certification Program for follow-up.
WAC reference	Chapter 246-292 WAC
Publications	Waterworks Operator Certification Program Guideline (331-109) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-109.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/WaterworksOperatorCertification.aspx
Standard language	
Other notes for the sanitary surveyor	<p>Community, nontransient noncommunity, and some transient noncommunity water systems that serve 250 people or less, and apply no treatment other than simple chlorination must employ an operator certified as at least a Water Distribution Specialist. This should cover most of the systems you survey.</p> <p>What the operator must know to pass the Water Distribution Specialist (WDS) Exam:</p> <p>Operate system</p> <p>System Design</p> <ul style="list-style-type: none"> • Flushing program • System layout • Assess system demand <p>System Inspection</p> <ul style="list-style-type: none"> • Cross-connection surveys/control • Well inspection <p>Chlorine Disinfection</p> <ul style="list-style-type: none"> • Monitor, evaluate, and adjust disinfection process <p>Water Quality Parameters and Sampling</p> <ul style="list-style-type: none"> • Chlorine demand/residual/dosage • Coliform <p>Operate equipment</p> <ul style="list-style-type: none"> • Chlorinators • Hydrants • Pumps • Valves <p>Install, Maintain and Evaluate Equipment</p> <p>Install and Maintain Equipment</p> <ul style="list-style-type: none"> • Pipe repair • Water mains • Service connections • Storage tanks <p>Evaluate operation of equipment</p>

	<ul style="list-style-type: none"> • Read meters • Troubleshoot electrical equipment <p>Perform Safety Procedures</p> <ul style="list-style-type: none"> • Chemical handling • Confined space entry • Fire safety • Lock-out and tag-out <p>Perform Administrative and Compliance Duties</p> <p>Administrative and Security</p> <ul style="list-style-type: none"> • Respond to complaints • Develop operation and maintenance plan • Record and evaluate data <p>Comply with Drinking Water Regulations</p> <ul style="list-style-type: none"> • Subpart B-Maximum contaminant levels • Subpart C-Monitoring and analytical requirements • Subpart D-Reporting and recordkeeping • Subpart Q-Public notification of drinking water violations <p>Operate system</p> <ul style="list-style-type: none"> • Add liquid disinfectants • Monitor, evaluate, and adjust chlorine disinfection • Inspect and maintain flow measurement • Inspect, maintain, and repair wells <p>Evaluate characteristics of source water</p> <ul style="list-style-type: none"> • Bacteriological • Biological • Chemical <p>Collect, perform and interpret laboratory analyses</p> <ul style="list-style-type: none"> • Chlorine demand • Chlorine residual • Microbiological <p>Operate equipment</p> <ul style="list-style-type: none"> • Chemical feeders • Instrumentation • Pumps <p>Evaluate operation of equipment</p> <ul style="list-style-type: none"> • Check speed of equipment • Perform preventive maintenance on chemical feeders • Read meters • Read pressure gauges <p>Perform administrative duties</p> <ul style="list-style-type: none"> • Administer safety program • Establish recordkeeping systems for facility operation • Record information relating to facility performance <p>Establish safety plans and apply safety procedures</p> <ul style="list-style-type: none"> • Chemical hazard communication • Confined space entry • Electrical grounding • General safety and health • Lock-out and tag-out • Personal protective equipment • Respiratory protection <p>The passing score for this exam is 70 percent</p>
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Item 100	Describe the operator's certification level (if certified), duration of employment with this water system, and relationship with the system (contract operator, SMA, direct-hire employee, volunteer, temporary, or owner).
Guidance	We want to know the type of operator (certified or not) and the relationship the operator has to the water system.
How to mark the checklist	Please record this information in the spaces provided.
Classification	Informational
WAC reference	Chapter 246-292 WAC
Publications	Waterworks Operator Certification Program Guideline (331-109) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-109.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/WaterworksOperatorCertification.aspx
Standard language	
Other notes for the sanitary surveyor	<p>Duties of a certified operator in responsible charge (WAC 246-292-032)</p> <ol style="list-style-type: none"> 1. A certified operator designated by the purveyor to be in responsible charge as required in WAC 246-292-020 shall perform or manage the public water system's daily operational and maintenance activities in this chapter, chapter 246-290 WAC, and according to acceptable public health practices and water industry standards. 2. A certified operator in responsible charge or designee must be available on-site or able to be contacted immediately by telephone or other electronic communication twenty-four hours per day, every day, and able to initiate appropriate action within two hours of contact. Appropriate action may include, but is not limited to: <ol style="list-style-type: none"> a. Making necessary repairs or resolving problems; or b. Directing staff or contractors to make necessary repairs or resolve problems. 3. The duties of a certified operator in responsible charge or designee include, but are not limited to: <ol style="list-style-type: none"> a. Conducting water quality monitoring, maintaining adequate records and taking follow-up action, if necessary, to comply with state and federal drinking water regulations. b. Implementing preventive maintenance programs, inspecting treatment and other public water system components for malfunctions, maintaining adequate records, and making needed repairs. c. Analyzing, reviewing, and maintaining records of instrument readings and laboratory test results, determining the location and causes of any malfunctions, adjusting various treatment processes or other components. d. Implementing a cross-connection control program, if directed by the purveyor. e. Determining and implementing remedial actions in an emergency and, if applicable, following departmental directives. f. Cooperating during a special purpose investigation or sanitary survey as required in chapter 246-290 WAC. g. Providing required records and reports to the department or its representative on request. <p>Failure to operate the water system according to state and federal drinking water laws and regulations could result in the suspension or revocation of an operator's certification.</p>

Item 101	Does the operator conduct self-inspections of the water system?
Guidance	Our initial notification letter explains that we expect the operator to conduct routine self-inspections of the water system facilities, with a focus on identifying and fixing any significant deficiencies and significant findings as defined by DOH.
How to mark the checklist	Mark as “Yes” if the purveyor conducts routine self-inspections of the water system. Record the scope and frequency of such inspections in the comments section of Part L.
Classification	Recommendation if marked “No.”
WAC reference	Chapter 246-292 WAC
Publications	Waterworks Operator Certification Program Guideline (331-109) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-109.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/WaterworksOperatorCertification.aspx
Standard language	We recommend that you conduct routine, meaningful self-inspections of your facilities using the DOH sanitary survey checklist as a guide to identify circumstances that are or may become significant deficiencies or significant findings.
Other notes for the sanitary surveyor	<p>Other WAC 246-292 main points:</p> <ul style="list-style-type: none"> • TNCs must employ a certified operator if: <ul style="list-style-type: none"> ○ The purveyor incurs repeated violations (coliform water quality, nitrate or coliform sampling). ○ The water system applies groundwater disinfection to meet a 4-log treatment requirement. ○ The water system operates a purification plant, such as surface water treatment, nitrate removal, iron and manganese removal, or desalination. • A certified operator – including contract operators – are expected to be in a position to respond to emergencies 24/7, and be in a position to begin taking steps to mitigate within 2 hours • A certified operator is expected to participate in sanitary surveys and special purpose investigations, and to participate in resolving deficiencies • A purveyor must notify DOH within 30 days of a change of operator or vacated operator position. <p>DOH’s certification program reviews the scope of each contract operator’s contract with a water system. We evaluate the contract to ensure it meets the duties of the operator in responsible charge (WAC 246-292-032). See page 159 of this publication.</p> <p>Certified operators must operate the water system consistent with experience and training appropriate to their level of certification and must perform their duties according to state rules (WAC 246-292). Certified operators are accountable for the actions taken by their designee.</p>

Item 102	Is the operator performing measurements and calibration of water treatment monitoring equipment consistent with manufacturer recommendations?
Guidance	For example, is the purveyor using an approved method to measure chlorine residuals, such as DPD or approved test strips? Hach Co. ¹⁷ and Lamotte Co. ¹⁸ manufacture common field test kits, among other manufacturers.
How to mark the checklist	Mark as “No” if in you believe the operator is not using the proper instruments and methods to perform field measurements for free chlorine, nitrate, pH, or other drinking water parameters that must be measured in the field for compliance purposes. Record your thoughts in the comment section in Part L of the checklist. Mark as “NA” if the operator performs no water treatment monitoring.
Classification	If marked “No,” this will be referred to the DOH Operator Certification Program for follow-up.
WAC reference	WAC 246-290-300
Publications	
Webpage(s)	
Standard language	DOH may contact you to inquire further into your methods of measurement, analysis and calibration of your water treatment monitoring equipment.
Other notes for the sanitary surveyor	<p>You should check the following for each purveyor measuring free chlorine in the distribution system:</p> <ol style="list-style-type: none"> 1. Is the purveyor using expired test kit reagent packets? 2. Is the reagent designed to measure total chlorine instead of free chlorine? 3. Is the volume of water the reagent is mixed into consistent with the reagent’s designated use? (For example, do they wrongly add a 5 ml reagent into 10 ml of water?) 4. Is the recorded value for free chlorine measurements outside the specified range of the test kit? (For example, does the operator record a value of 0.05 mg/l when the accuracy of the test kit is only down to 0.1 mg/l?) 5. Does the operator misinterpret the measured value? (For example, did the operator record the free chlorine concentration as 2.0 mg/l when it really measured at 0.2 mg/l?) 6. Does the operator properly establish a “zero” value for the digital DPD free chlorine colorimeter? 7. The presence of manganese in water will result in over-estimating the level of free chlorine residual in the distribution system. Is there a possibility of manganese interference with the free chlorine test used? <p>Document any issue with the method of measurement, analysis, or calibration of the water treatment water quality monitoring devices, and DOH will follow-up.</p>

¹⁷ <http://www.hach.com/>

¹⁸ <http://www.lamotte.com/en/>

Item 103	Is the operator using proper inputs to treatment plant operations reports (such as correct volume, peak flow rate, time) and making the proper calculations?
Guidance	<p>The most common treatment operations you'll observe that require more than simply measuring the concentration of some drinking water parameter is CT6 disinfection of a groundwater source prior to the first connection. See information in checklist item 46, 51 and 52.</p> <p>Look at the monthly chlorination water treatment plant report form the operator will submit to DOH after the end of the current month. Attempt to follow the operator's thought processes and calculations, from measurement to final input onto the form.</p>
How to mark the checklist	<p>Mark as "No" if you believe the operator is using improper inputs to treatment plant operations reports. Record your thoughts in the comment section of Part L on the checklist.</p> <p>Mark as "NA" if the operator performs no water treatment.</p>
Classification	If marked "No," this will be referred to the DOH Operator Certification Program for follow-up.
WAC reference	<p>WAC 246-290-300</p> <p>WAC 246-290-480</p>
Publications	<p><i>Measuring Free Chlorine</i> (331-442) http://www.doh.wa.gov/portals/1/Documents/pubs/331-442.pdf</p> <p><i>Chlorine contact time for small water systems</i> (331-343) http://www.doh.wa.gov/portals/1/Documents/pubs/331-343.pdf</p>
Webpage(s)	
Standard language	I have some concerns about the inputs used to measure and report compliance data for your water treatment system. DOH may contact you to inquire further into your data collection and calculations.

Other notes for the sanitary surveyor	<p>Common mistakes and improper inputs:</p> <ol style="list-style-type: none"> 1. Math errors (addition, subtraction, multiplication, division). 2. Doing things the same way after something changes, and the same-old-way no longer applies. For example, 20 years ago an operator calculated that he or she had to add at least 0.4 mg/l of free chlorine to achieve CT6 at a specific compliance point prior to the first customer downstream of the source undergoing treatment. Since then: <ol style="list-style-type: none"> a. A new customer located closer to the source. Now the compliance point must move too, so it is still prior to the first customer. b. The water system installed a new well pump, so the pumping rate is now 50 gpm more than it was 20 years ago. Now the water moves through the old pipeline quicker and gets fewer minutes of contact time before the first customer. 3. Measuring total chlorine instead of free chlorine. Free chlorine is the correct form of chlorine residual to measure for disinfection treatment reporting purposes. 4. Using total tank volume when a storage tank provides required contact time (dividing the total tank volume by the peak-flow rate to get the residence time of water in the storage tank). Storage tanks short-circuit water and provide poor mixing. Therefore, to establish the residence time correctly, you must discount the storage tank volume, usually by 90 percent when calculating chlorine contact time for a single inlet-outlet pipe in the storage tank. (If the storage tank is 100,000 gallons, the correct calculation for residence time would be 10,000 gallons divided by the peak flow rate out of the tank). 5. Using average flow rate instead of peak flow rate. Peak flow rate should be used in the calculation. 6. Incorrectly measuring the length or volume of the pipe used for chlorine contact time before the first customer.
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Item 104	Does the operator take compliance water quality samples at the proper location?
Guidance	<p>Sampling from an improper location may defeat the purpose of the sampling. Below, we explain where we expect the operator to collect some of the most common samples.</p> <p>The SWSMP guide (see Item 3) devotes a section to developing monitoring plans (coliform, source chemicals, treatment-related).</p>
How to mark the checklist	<p>Mark as “No” if you are certain that the operator is collecting water quality samples from an improper location. Record your thoughts in the comment section on Part L on the checklist.</p> <p>There is no “NA” option on the checklist. Every operator must collect some water quality samples, even when there is no water treatment.</p>
Classification	If marked “No,” this will be referred to the DOH Operator Certification Program for follow-up.
WAC reference	WAC 246-290-300, -310, and -320
Publications	<p><i>General Sampling Procedure</i> (331-219) http://www.doh.wa.gov/portals/1/Documents/pubs/331-219.pdf</p> <p><i>Volatile Organic Chemical (VOC) Sampling Procedure</i> (331-220) http://www.doh.wa.gov/portals/1/Documents/pubs/331-220.pdf</p> <p><i>Inorganic Chemical (IOC) Sampling Procedure</i> (331-221) http://www.doh.wa.gov/portals/1/Documents/pubs/331-221.pdf</p> <p><i>Nitrate Sampling Procedure</i> (331-222) http://www.doh.wa.gov/portals/1/Documents/pubs/331-222.pdf</p> <p><i>Haloacetic Acid (HAA5) Sampling Procedure</i> (331-223) http://www.doh.wa.gov/portals/1/Documents/pubs/331-223.pdf</p> <p><i>Synthetic Organic Chemical (SOC) Sampling Procedure</i> (331-224) http://www.doh.wa.gov/portals/1/Documents/pubs/331-224.pdf</p> <p><i>Coliform Distribution System Sampling Procedure</i> (331-225) http://www.doh.wa.gov/portals/1/Documents/pubs/331-225.pdf</p> <p><i>Total Trihalomethane (TTHM) Sampling Procedure</i> (331-226) http://www.doh.wa.gov/portals/1/Documents/pubs/331-226.pdf</p> <p><i>Lead and Copper Sampling Procedure</i> (331-227) http://www.doh.wa.gov/portals/1/Documents/pubs/331-227.pdf</p>
Webpage(s)	
Standard language	I have some concerns about where you are sampling water quality for compliance reporting. DOH may contact you to inquire further into where you collect your compliance samples.

<p>Other notes for the sanitary surveyor</p>	<p>Routine Coliform: From a representative location in the distribution system. Do not take these samples at a source.</p> <p>Repeat Coliform: From the distribution system, at the original site of the unsatisfactory routine sample.</p> <p>Source chemicals (inorganic, volatile organic): From the source, after all treatment.</p> <p>Common concerns and errors:</p> <p>Distribution system samples (coliform, chlorine residual, lead and copper) collected from a residence or business with its own water treatment facility (softener, carbon filter).</p> <p>Well field sample collected from one well instead a location where the production from all the well field wells comes together prior to entering the distribution system.</p>
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Not on checklist	<p><u>Additional surveyor comments about the certified operator:</u></p> <p>You should consider the following question after completing the survey, and inform DOH without disclosure to the operator:</p> <p>Is the certified operator in responsible charge carrying out his or her duties as outlined in regulation?</p>
Guidance	For information on the duties of a certified operator ¹⁹ , refer to WAC 246-292-032.
Contact DOH	Any surveyor who has reason to believe the operator is not performing the functions that must be performed by a certified operator should contact the DOH Operator Certification Program at 1-800-525-2536 immediately after completing the survey. Depending on the evidence presented, DOH may undertake a formal investigation into the allegation.
Classification	This is a potential significant deficiency pending the outcome of DOH's investigation.
WAC reference	Chapter 246-292 WAC
Publications	Waterworks Operator Certification Program Guideline (331-109) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-109.pdf
Webpage(s)	http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/WaterworksOperatorCertification.aspx
Standard language	
Other notes for the sanitary surveyor	

¹⁹ <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/Rules.aspx>

Not on checklist	<p><u>Additional surveyor comments about the certified operator:</u></p> <p>You should consider the following question after completing the survey, without disclosure to the operator:</p> <p>Do you have any reason to suspect false or misleading reporting of water quality, treatment operations, status of previously identified significant deficiencies, or completion status of mandatory public notification?</p>
Guidance	<p>Fraudulent reporting is an extremely serious offense, with potential harsh punishment. Fraudulent reporting means the operator intentionally reports false or misleading information, whether directed by others to do so or not.</p>
Contact DOH	<p>Any surveyor who has reason to believe the operator has intentionally misled DOH should contact the DOH Operator Certification Program at 1-800-525-2536 immediately after completing the survey. Depending on the evidence presented, DOH may undertake a formal investigation into the allegation.</p>
Classification	<p>This is a potential significant deficiency pending the outcome of DOH's investigation.</p>
WAC reference	<p>Chapter 246-292 WAC</p>
Publications	<p><i>Waterworks Operator Certification Program Guideline</i> (331-109) http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-109.pdf</p>
Webpage(s)	<p>http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/WaterworksOperatorCertification.aspx</p>
Standard language	<p>None</p>
Other notes for the sanitary surveyor	

Checklist Part M: Field Notes and Other

You should list:

- All tests performed by either the operator or the surveyor
- All physical measurements made by either the operator or the surveyor
- All repairs made by the operator or owner (the surveyor should NEVER make repairs to the water system)

Checklist Part N: Supplemental Notes and Safety Concerns

You should include a description of any problem that you want DOH to consider a significant finding or an item for referral to a DOH program specialist. See sections 5.1 and 5.2.

If you find unsafe conditions in the field and you feel you have competent knowledge of basic safety standards, we encourage you to point out the safety hazard and refer the operator to the Department of Labor and Industries (L&I) consulting services. L&I has regulatory authority over workplace safety. Let the operator know that L&I provides free technical assistance (consultations) to water systems that want help identifying and correcting issues, and share the L&I safety consultants [contact information](#)²⁰. You should NOT list safety hazards as a deficiency.

Examples include confined spaces, climbing hazards, obvious electrical hazards, aggressive dogs and unsafe structures. Notes on these subjects will help to prepare the surveyor who performs the next sanitary survey.

Checklist Part O: Water System Facilities Field Schematic

Schematics should illustrate the flow of water from source to the distribution system and should include all sources (showing each entry point), reservoirs, points of treatment and disinfection, distribution system, and interties. For common shapes, use the symbols provided by copying them and positioning them electronically onto the blank space on the page.

Checklist Part P: Inventory of Potential Contaminant Sources

Identify potential sources of contamination on the blank portion of the page by type and distance, and complete in the SCA radius and description of features table.

²⁰ <http://www.lni.wa.gov/Safety/Basics/Assistance/Consultation/consultants.asp>

Water Facilities Inventory (WFI) Form

INSTRUCTIONS (See WFI Form that follows these instructions)

Cross out outdated information, and then write corrections in any adjacent space available

	Field Number and Field Name	Instruction
ADDRESSES & PHONE NUMBERS	6. PRIMARY CONTACT NAME & MAILING ADDRESS	<p>Enter the name of the person we should contact about the water system's day-to-day operations. Most DOH mailings will be sent to this person.</p> <p>Enter only the mailing address in this part of the box Do not combine a PO Box with a street address).</p> <p>Enter the <i>Physical Delivery Address</i> for the contact person if it is different than the normal mailing address. (This address will be used to ship sampling containers or other materials that cannot be delivered to a P.O. Box). Example:</p> <p><u>Name & Mailing Address</u> ANN SMITH ATTN (optional) P O BOX 3030 ANYTOWN WA 98000</p> <p><u>Physical Delivery Address, if different from Above</u> ATTN (Optional) 1231 MAIN ST ANYTOWN WA 98000</p>
	7. OWNER NAME & MAILING ADDRESS	Enter the name of the person or organization that is the legal owner of the water system. Follow the directions and example in field 6 (above). <i>If the owner is an organization, you must list an individual as the contact for the organization.</i>
	9. 24 HOUR PRIMARY CONTACT INFORMATION	Enter phone and fax numbers including area code (and extension, if applicable) for the primary contact for the water system. The email address may be for the system or the primary contact.
	10. OWNER CONTACT INFORMATION	Enter the phone and fax numbers including area code (and extension, if applicable) for the owner of the water system.
CHECK BOXES	11. SATELLITE MANAGEMENT AGENCY (SMA)	If the system is NOT owned or managed by a Satellite Management Agency (SMA), check "Not Applicable" and go to 12. If the system IS owned or managed by a SMA, check the applicable box and enter the name of the SMA. <i>The SMA number is assigned by DOH.</i>
	12. WATER SYSTEM CHARACTERISTICS	<p>Mark ALL boxes that apply to your system. You may check more than one box for each service. For example, a restaurant may be "Food Service" and "Commercial."</p> <ul style="list-style-type: none"> * Agricultural: Commercial crop irrigation/Farming * Commercial / Business: Office & retail complexes, nurseries, golf courses. * Day Care: Child or adult care facilities (in home or stand alone where the clients do not live 24 hrs. per day). * Food Service/Food Permit: Restaurant, coffee shop, bakery, tavern, catering facility, deli, grocer, mini-mart. * 1,000 or more person event for 2 or more days per year: Major event that significantly affects your system, such as a fair, town festival, or major concert. * Hospital/Clinic: Medical / Dental office or clinic, Surgery Center, Emergency Care Facility. * Industrial: Manufacturing, assembly facility, food processing facility. * Licensed Residential Facility: Nursing home, adult boarding home, foster home. * Lodging: Hotel, motel, inn, bed and breakfast, resort. * Recreational / RV Park: Connections serving parks, beaches, ball fields, playground, campgrounds, picnic areas, ski areas, transient recreational vehicle facilities. * Residential: Units designed to house one or more family (such as single family houses, apartments, duplexes, condominiums, mobile home parks, etc.) no matter how many days per year they are occupied. * School: K-12 grades, community college, technical training facility, colleges. * Temporary Farm Worker Housing / Labor Camp: Facility that provides temporary facilities for workers and their families. May or may not meet the criteria for DOH Temporary Worker Housing licensing. * Other: If choosing "other," please write a brief description in the blank provided (fire station, fraternal organization, grange).

	13. WATER SYSTEM OWNERSHIP	<p>Mark <i>only one</i> type of organization that best describes the owner of the water system.</p> <p>Association: A non-government water system owned by its consumers (sometimes called “members”). It includes “mutual” water companies.</p> <p>City / Town: A city or town that has been incorporated according to the applicable RCW.</p> <p>County: A water system owned by county government, such as a county park, or public works maintenance facility.</p> <p>Federal: A water system owned by the federal government, such as a veterans’ hospital, national park, forest service facility.</p> <p>Investor: A privately owned water system operated with the intent of making profit. The owner may be regulated (or potentially regulated) by the Washington Utilities and Transportation Commission (WUTC).</p> <p>Private: A privately owned water system, not including Associations, that is not operated with the intent of making a profit. Examples are water systems serving mobile home parks, stores, industries, and so on.</p> <p>Special District: A special purpose district created according to applicable RCW, such as a Water or Sewer District, Public Utility District, School District, Fire District or Port District.</p> <p>State: A water system owned by the state, such as a state park, correctional facility, or a Department of Transportation rest area or maintenance facility.</p>
	14. STORAGE CAPACITY	Enter the total storage capacity (in gallons) available for distribution to users (if 1,000 gallons or greater). Do not include pressure tank(s) in the total.

SOURCES	16. SOURCE NAME	Enter your name for the source (such as, Park Well). If the source is purchased or an intertie, list the name of the system providing the water. Each well in a well field or spring in a spring field must be identified. Please provide Well Tag number if available.
	17. INTERTIE	Enter the ID number of the system providing purchased water or intertie. If you do not know the ID number, contact your DOH regional office.
	18. SOURCE CATEGORY	Mark the box that best describes this source. Each source can have only one code. Each well in a well field, and spring in a spring field must be identified individually.
	19. USE	<p>Mark the box that best describes how this source is used.</p> <p>Permanent: A source that is used regularly each year for <u>more than 3 consecutive months within a 12-month period</u>. For systems that are in operation for 3 or less months, their sources shall also be considered permanent.</p> <p>Seasonal: A source that is used on a regular basis and does not meet the definition of either permanent or emergency source. Seasonal source <i>could</i> be used to supply peak demand.</p> <p>Emergency: A source that has been approved by DOH for emergency use and is <i>not</i> used for routine or seasonal peak water demands.</p>
	20. SOURCE METERED	Mark this box if this source has a water meter installed.
	21. TREATMENT	If this source is not treated, mark “none,” otherwise mark the box(es) for each type of treatment provided for this source. If a well in a well field or a spring in a spring field has its own individual treatment, mark the appropriate box. If all the wells in a well field or springs in a spring field are treated together at one location, mark the appropriate box on the well or spring field line. Treatment for an intertie refers only to <u>additional</u> treatment by the receiving system.
	22. DEPTH TO FIRST OPEN INTERVAL	For <u>cased</u> wells, enter depth to top of uppermost well screen or perforated casing; for wells <u>completed in rock</u> , enter depth to bottom of sealed casing; for <u>dug</u> wells, enter depth to first unsealed casing joint below the well seal; and for well fields, enter depth of shallowest well. Round off to the nearest whole number.
	23. CAPACITY	Enter the actual current capacity of the source, in gallons per minute (gpm) that is available to enter the distribution system under operating conditions. For example, if the source is a well with a pump test of 100 gpm, but only has a 20-gpm pump installed, enter 20 gpm.
	24. SOURCE LOCATION	Enter the quarter / quarter designation, section number, township and range location for each source. For Example, SE/SW, Sec.1, T18N, R3E. Source locations can be found on well logs, water right documents, or property descriptions.

CONNECTIONS	25-A. FULL TIME SINGLE-FAMILY RESIDENCES	Enter the number of single-family residences (including mobile homes) occupied any 180 days or more a year that are served by the water system. If you enter a number in this field, you also need to enter a number for the corresponding population residing in these connections in field 29. A connection is considered active until it is physically disconnected from the water system.	
	25-B. PART TIME SINGLE-FAMILY RESIDENCES	Enter the number of single-family residences (including mobile homes) occupied less than 180 days a year that are served by the water system. (These part-timers most likely inhabit vacation homes that are not used as a primary residence) If you enter a number in this field, you also need to enter data for the corresponding population residing in these connections in rows 30A and 30B. A connection is considered active until it is physically disconnected from the water system.	
	26-A. APARTMENT BUILDINGS, CONDOS, OTHER MULTIFAMILY BUILDINGS, BARRACKS, DORMS	Enter the number of apartment buildings, condominium buildings, duplex buildings, barracks, and dormitory buildings, and so on served by your water system.	
	26-B. FULL TIME RESIDENTIAL UNITS	<i>If the water system serves multifamily residential buildings, enter the total number of residential units that are occupied any 180 days or more a year. If you enter a number in this field, you also need to enter a number for the corresponding population residing in these connections in field 29.</i>	
	26-C. PART TIME RESIDENTIAL UNITS	<i>If the water system serves multifamily residential buildings, enter the number of individual dwelling units that are occupied less than 180 days a year. If you enter a number in this field, you also need to enter data for the corresponding population residing in these connections in rows 30A and 30B.</i>	
	27-A. RECREATIONAL SERVICES OR TRANSIENT ACCOMMODATIONS CALL YOUR REGIONAL OFFICE IF YOU ARE UNSURE WHETHER YOURS IS A COMMUNITY, NONCOMMUNITY, OR GROUP B SYSTEM	COMMUNITY SYSTEMS: Leave this field empty. Include in field 27B the actual number of RV parks, campgrounds, hotels, motels, and so on served.	NONCOMMUNITY and GROUP B SYSTEMS: Enter the actual number of RV sites, campsites, spigots, etc., and hotel/motel/overnight units that are served by the water system. Enter the corresponding nonresidential population and use-days in rows 31A and 31B.
	27-B. INSTITUTIONAL, COMMERCIAL, OR INDUSTRIAL SERVICES	COMMUNITY SYSTEMS: Enter the number of all service connections not used for residential purposes. Include RV parks, campgrounds, hotels, motels, etc. in your count of commercial connections. If you enter a number in this field, enter the corresponding non-resident population and use-days in rows 31A, 31B, 32A, and 32B.	NONCOMMUNITY and GROUP B SYSTEMS: Enter the number of all service connections not used for residential purposes and not otherwise accounted for in field 27A. If you enter a number in this field, enter the corresponding non-resident population and use-days in rows 31A, 31B, 32A, and 32B.
POPULATIONS	29. FULL TIME RESIDENTIAL POPULATION	Enter the total number of residents that are served by the water system for any 180 days or more per year.	
	30-A. PART TIME RESIDENTS PER MONTH	Enter the TOTAL number of seasonal or weekend <u>residents</u> that are present each month . (These part-timers most likely inhabit vacation homes that are not used as a primary residence).	
	30-B. PART TIME RESIDENT USE DAYS PER MONTH	Enter how many days part-time residents are present each month.	
	31-A. TEMPORARY & TRANSIENT USERS PER MONTH	Enter the TOTAL number of temporary or transient users served by the water system each month . This includes all visitors, attendees, travelers, campers, patients, or customers with access to establishments connected to the water system. <i>Visitors must be counted for every day that they have access to the water system. For example, an individual attending a weeklong camping session (seven days) must be counted seven times.</i>	
	31-B. TEMPORARY & TRANSIENT USE DAYS PER MONTH	Enter the TOTAL number of days per month this system is accessible or available to the public.	
	32-A. REGULAR NONRESIDENTIAL USERS PER MONTH	Enter the number of students, daycare children, and all employees that are served by the water system during each month.	
	32-B. REGULAR NONRESIDENTIAL USE DAYS PER MONTH	Enter the number of days per month that students, daycare children, and employees have access to the water.	
SIGNATURE	35. REASON FOR SUBMITTING THE WFI	Check the appropriate box. If you are submitting this WFI as requested by DOH, please refer to the instructions in the letter.	
	36. CERTIFICATION	Please sign and print your name and the date you are signing the WFI. Please include your title or relationship with this water system.	

Water Facilities Inventory (WFI) Form

ONE FORM PER SYSTEM

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
6. PRIMARY CONTACT NAME & MAILING ADDRESS		7. OWNER NAME & MAILING ADDRESS		8. Owner Number:
ORGANIZATION NAME		ORGANIZATION NAME		
PRIMARY CONTACT NAME TITLE:		NAME TITLE:		
ADDRESS		ADDRESS		
CITY STATE ZIP		CITY STATE ZIP		
STREET ADDRESS IF DIFFERENT FROM ABOVE		STREET ADDRESS IF DIFFERENT FROM ABOVE		
ADDRESS		ADDRESS		
CITY STATE ZIP		CITY STATE ZIP		

9. 24-HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:		Owner Daytime Phone:	
Primary Contact Evening Phone:		Owner Evening Phone:	
Primary Contact Mobile/Cell Phone:		Owner Mobile/Cell Phone:	
Fax:	Email:	Fax:	Email:

WAC 246-290-420()) requires water systems to provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY – SMA (check only one)	
<input type="checkbox"/> Not applicable (Skip to #12)	
<input type="checkbox"/> Owned and Managed	SMA NAME: SMA Number:
<input type="checkbox"/> Managed Only	

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)		
<input type="checkbox"/> Agricultural	<input type="checkbox"/> Hospital/Clinic	<input type="checkbox"/> Residential
<input type="checkbox"/> Commercial / Business	<input type="checkbox"/> Industrial	<input type="checkbox"/> School
<input type="checkbox"/> Day Care	<input type="checkbox"/> Licensed Residential Facility	<input type="checkbox"/> Temporary Farm Worker
<input type="checkbox"/> Food Service/Food Permit	<input type="checkbox"/> Lodging	<input type="checkbox"/> Other (church, fire station, etc.):
<input type="checkbox"/> 1,000 or more person event for 2 or more days per year	<input type="checkbox"/> Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)		14. STORAGE CAPACITY (gallons)
<input type="checkbox"/> Association	<input type="checkbox"/> County	
<input type="checkbox"/> City / Town	<input type="checkbox"/> Federal	
<input type="checkbox"/> Investor	<input type="checkbox"/> Private	
<input type="checkbox"/> Special District	<input type="checkbox"/> State	

15.	16. SOURCE NAME	17. INTERTIE SYSTEM ID NUMBER	18. SOURCE CAPACITY								19. USE	20.	21. TREATMENT					22. DEPTH	23.	24. SOURCE LOCATION								
	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE		WELL	WELL IN A WELL FIELD	SPRING	SPRING IN A	SPRINGFIELD	SEAWATER	SURFACE WATER	RAINNEY INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	(DEPTH TO FIRST OPEN INTERVAL)	CAPACITY GALLONS PER MINUTE	1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE	
S0																												
S0																												
S0																												
S0																												
S0																												

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)			
A. Full Time Single Family Residences (Occupied 180 days or more per year)			
B. Part Time Single Family Residences (Occupied less than 180 days per year)			
26. MULTIFAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms			
B. Full Time Residential Units in Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year			
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms, that are occupied less than 180 days/year			
27. NONRESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services (Campsites, RV Sites, Spigots, etc.)			
B. Institutional, Commercial/Business or Industrial Services			
28. TOTAL SERVICE CONNECTIONS			

29. FULL-TIME RESIDENTIAL POPULATION
How many residents are served by this system 180 or more days per year? _____

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												
31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients, or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												
32. REGULAR NONRESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students, daycare children, or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
34. GROUP B NITRATE SCHEDULE	QUARTERLY				ANNUALLY				ONCE EVERY 3 YEARS			
	N/A				N/A				N/A			

35. REASON FOR SUBMITTING WFI:

☐ New System ☐ Other _____

36. I CERTIFY THAT THE INFORMATION STATED ON THIS WFI FORM IS CORRECT TO THE BEST OF MY KNOWLEDGE.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

